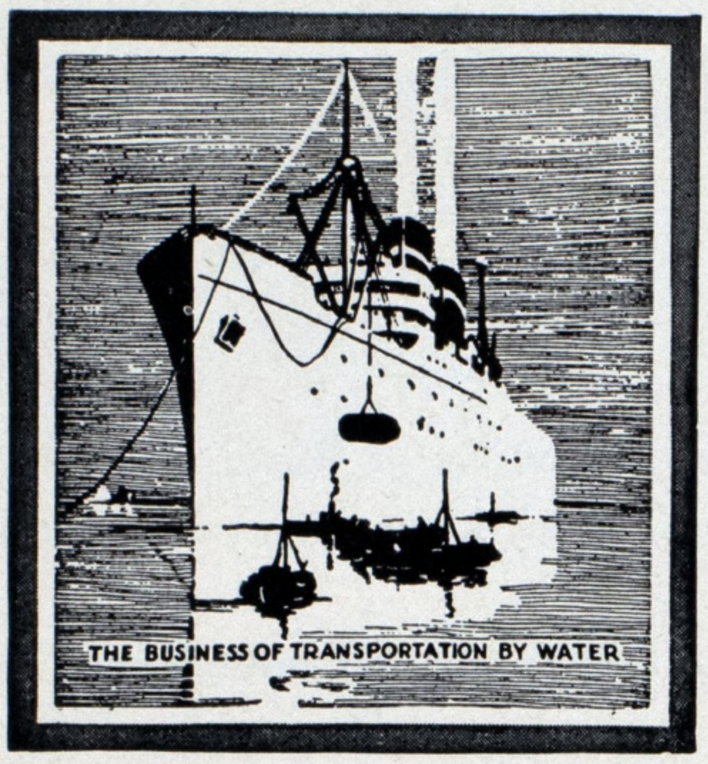
Marine Review

The National Publication Covering the Business of Transportation by Water

CLEVELAND **FOUNDED 1878** **NEW YORK**



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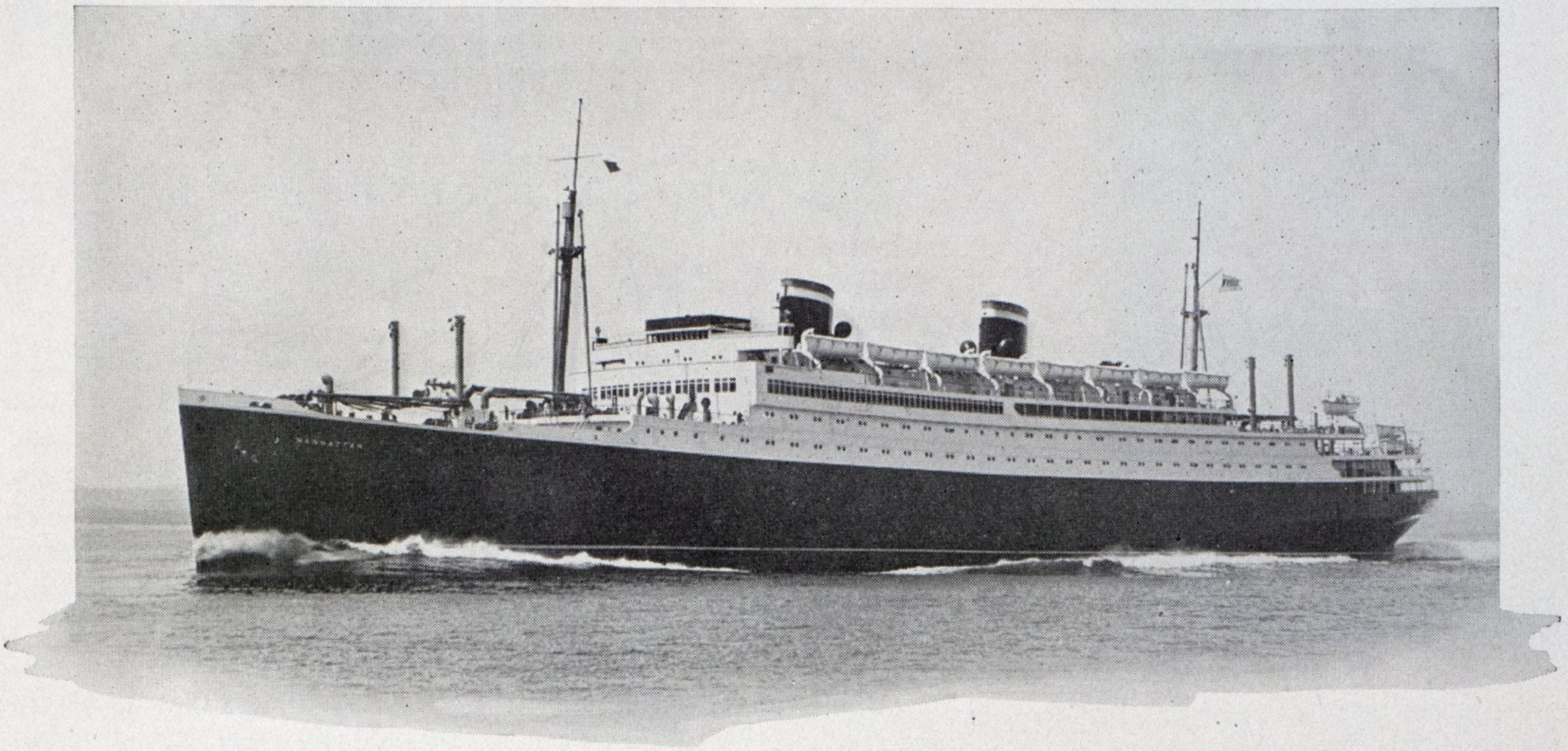
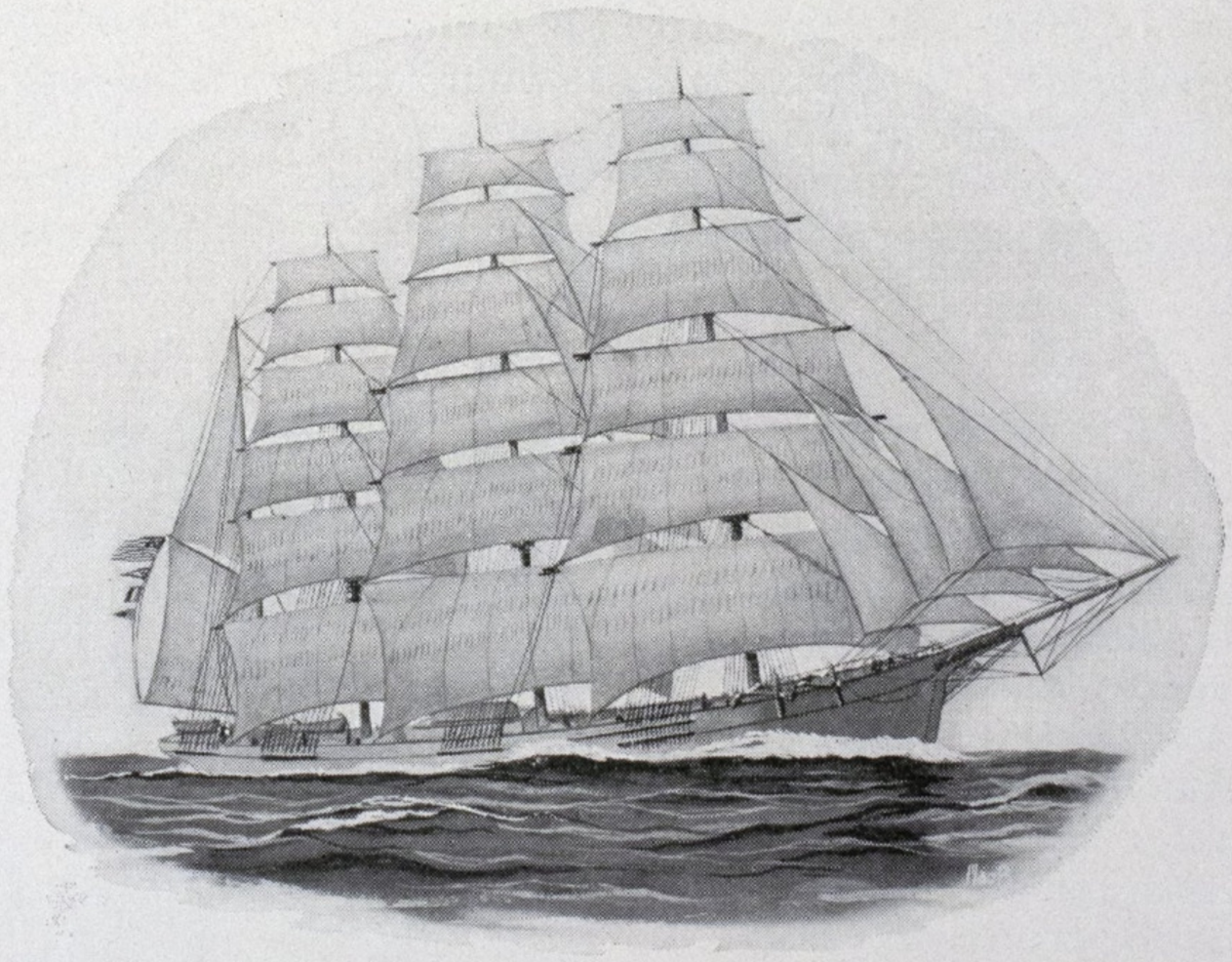
T. S. S. MANHATTAN



T. S. S. MANHATTAN

NEARLY eighty years have gone by since the Great Republic, Donald McKay's supreme achievement. Of her it has been justly said: "She was the finest, largest—perhaps the swiftest sailing vessel in the world, and in an era of ships she symbolized the growing strength and greatness of our country".

May the T. S. S. Manhattan, as the largest, finest—perhaps the swiftest merchant vessel ever built in the United States, be the harbinger of the return of our maritime supremacy established in the days of sail.



GREAT REPUBLIC

T. S. S. MA

Crosses Atlantic in Reco

KERMIT Roosevelt, president of the Roosevelt Steamship Co., managing operator of the T. S. S. Manhattan, owned by the United States Lines. R. Stanley Dollar is president of the United States Lines

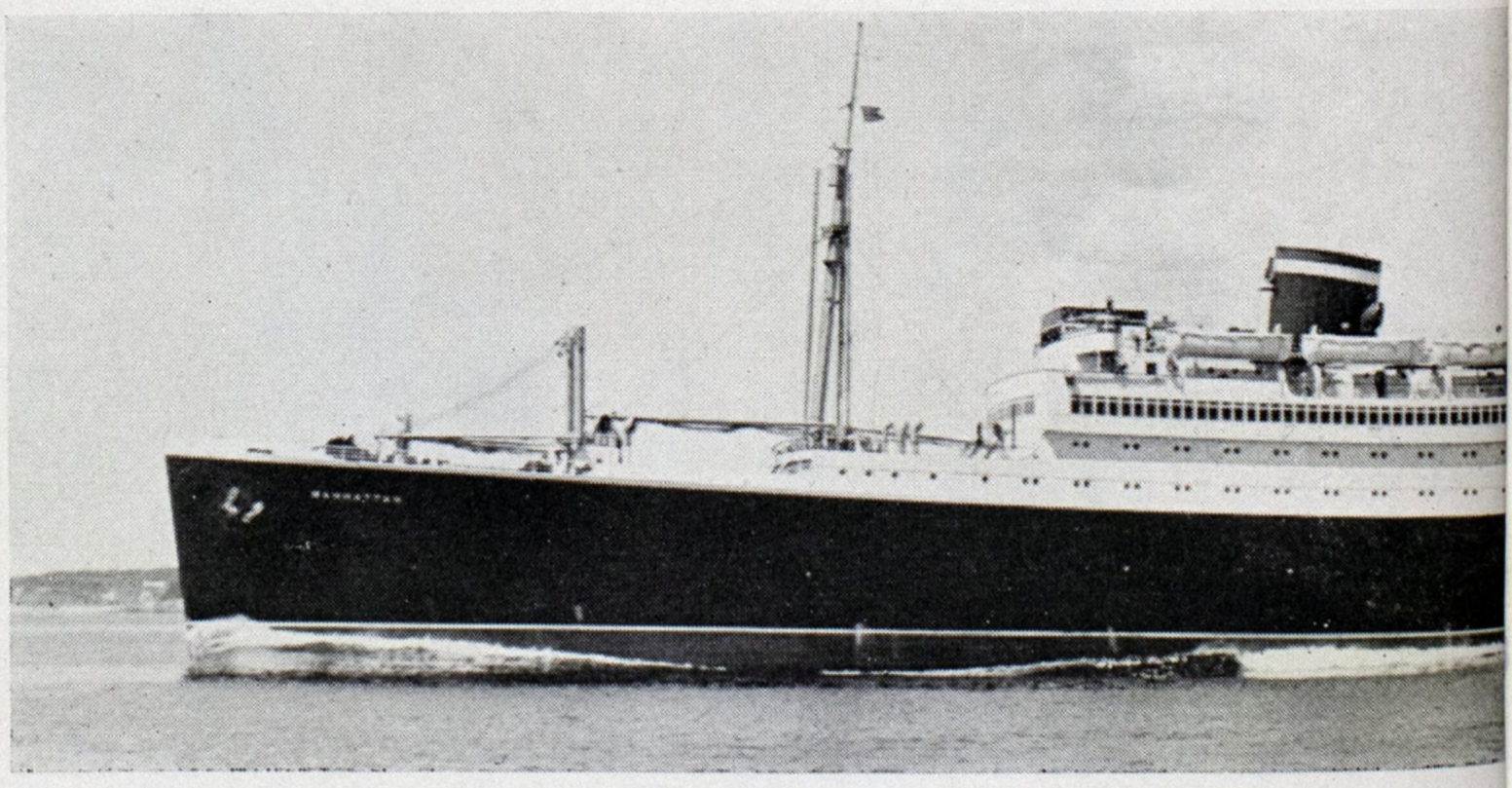
SOMETIMES events of the greatest significance in the life of a nation receive but scant attention at the time. Such an event has recently taken place in the completion and entry into service of the T. S. S. MANHATTAN, largest and finest merchant ship built on this side of the Atlantic. The real evaluation of the significance of this event must be left to the historian of the future.

When the Republic was young and occupied mainly the sea coast states the merchant marine developed rapidly as a natural and convenient outlet for the restless and vigorous energy of a people bred to the sea. After the Civil war the development of a vast inland empire absorbed the energies of the people. In a word there was so much to be done in building up the interior that interest waned in shipping.

Conditions now are entirely different and it is evident that there has been a definite reawakening of interest in maritime affairs. During the period of the development of industry and the extension of agricultural pursuits, as a nation we were more or less content to let others carry our overseas trade. We were too busy to worry much about its ultimate effect on our progress as a great nation. But certain episodes in the history of the last 35 years emphasized our helplessness, such as the Spanish-American war; the famous round-the-world voyage of the American fleet in the time of Roosevelt; the early years of the World war; and the greatest shock of all, our merchant marine unpreparedness when we were drawn in.

These lessons made a deep impression on the American people and they began to realize that without a merchant marine of our own we would be at the mercy of the exigencies of the selfish interests of those who carried our goods overseas. As a result of these lessons and a steadily growing appreciation the value of some control over the carriers of our commerce, legislation to make possible a merchant marine of our own, in the acts of 1916, 1920 and 1928, was placed on our statute books.

WITH the sailing from New York of the T. S. S. Manhattan on her maiden voyage Aug. 11, the peak of achievement in building a new American merchant marine has been reached just a little over four years after President Coolidge signed the merchant marine act of 1928. Her sister ship, the Washington, will be completed next May.



T. S. S. Manhattan off Rockland, Me., During Stand

NHATTAN

rd Time for Cabin Liners

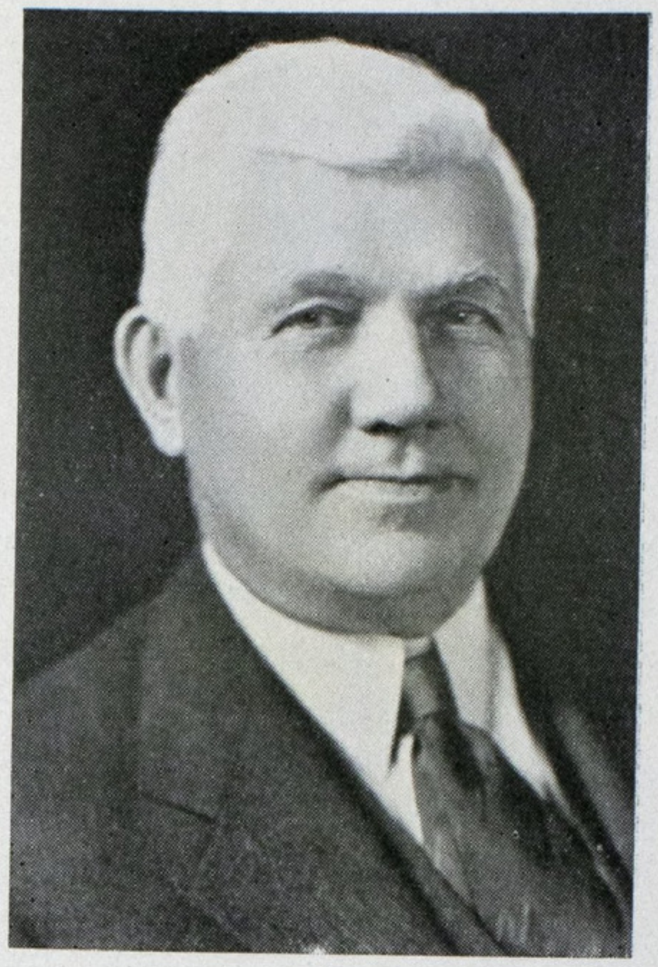
BY A. H. JANSSON

Since the act of 1928 we have in these columns reported the successful completion of a considerable number of the finest kind of modern ships built for specific services and trades under the terms of over 40 mail contracts awarded under the authority of this act. For the period of the mail contracts, of 10 years from date of award, additional new vessels and others elaborately rebuilt and brought up to date are still to be built and placed in service.

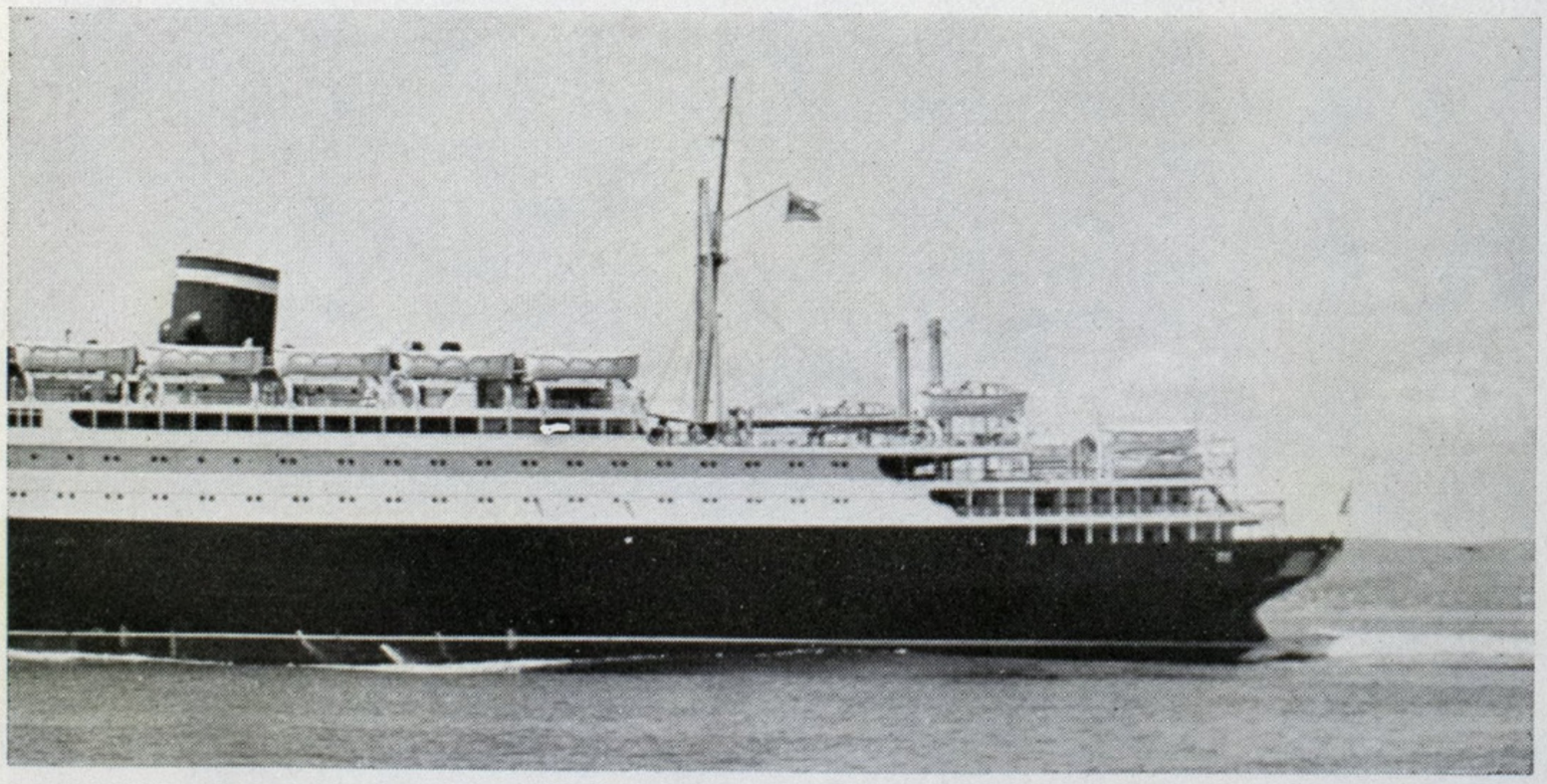
With this as a solid foundation of good planning and an awakened public consciousness of the need of a well-rounded efficient and adequate merchant marine we must follow through with intelligence and energy. This plan which has worked so well in its inception should be strengthened in every feature which our experience now shows needs to be strengthened. It should be extended to include the backbone of any merchant marine, the modern freight liner so that every trade route will be fully and efficiently served.

The completion of the T. S. S. MANHATTAN is a striking practical demonstration of the skill of American designers and shipbuilders in creating the largest type of merchant ship, fully equal and in some respects superior to the best in other lands. The fact that the MANHATTAN was fully booked on both her eastward and westward maiden voyages, even under present conditions of business, clearly indicates the economic value of planning to meet public demand. In the following pages will be found a record of this latest and greatest achievement in American shipbuilding, a fore runner of still greater ships to come.

In her first transatlantic voyage the MANHATTAN established a record as the world's fastest cabin liner. Leaving her New York pier at 1:15 a. m. Aug. 11, she arrived at Cobh, Ireland, at 9:55 p. m. Aug. 16. Her official time from Ambrose channel light vessel to Rooche's point, a distance of 2878 miles was 5 days, 14 hours and 25 minutes.



CLINTON L. Bardo, president of the New York Shipbuilding Co., designer and builder of the T. S. S. Manhattan, the largest and most elaborate merchant vessel built in the United States up to the present



ardization Trials July 25 While Making 22.7 Knots

EXPERIENCE shows that the policy of encouraging American shipowners in the building of specific ships exactly suited to specific trades is sound and effective. Under this wise government plan our lines of communication have been immeasurably strengthened and the essential industry of shipbuilding has been maintained.

T. S. S. MANHATTAN

Trials at Sea, and Building Cost

LET us begin this story of the T. S. S. MANHATTAN, the largest and highest powered merchant ship ever built in an American shipyard with an account of her highly successful trials at sea. With nearly 300 guests, representing the government and the maritime industry of the country, the MANHATTAN left the pier of her builder, the New York Shipbuilding Co., Camden, N. J. at 1:45 p.m. on July 23 for her official sea trials off Rockland, Me. In command during the trials was the veteran trial commander Capt. Joseph I. Kemp.

After final compass adjustment in lower Delaware bay the vessel proceeded on her way

Capt. George Fried, commander of the MANHATTAN *and at his right, Mrs. Theodore Roosevelt Sr. (sponsor) at the launching at Camden, N. J., Dec.* 5, 1931

gradually working up to an output of 30,000 shaft horsepower. From 8:00 a.m. to 12 noon on the twenty-fourth a four-hour trial was conducted to determine the guaranteed water rate of the main turbines. During this time instruments were checked and observers were rehearsed for the official fuel consumption trial. The measured water rate corrected to the standard conditions of 375 pounds steam pressure per square inch at gage and 650 degrees Fahr. temperature was found to be 7.65 pounds per shaft horsepower per hour which was one-tenth pound less than the guaranteed rate.

A successful windlass test was carried out after the MANHATTAN arrived off Rockland at 10:00 p.m. July 24. At daybreak on July 25, the MANHATTAN proceeded to the United States navy measured mile trial course. Standardization runs commenced at 6:49 a.m. and were completed at 2:20 p.m. At 10, 15, 18 and 20 knots three runs were made over the course and five runs were made at full power. These trial runs over the measured nautical mile course in deep water fully met every expectation and the full power runs definitely established reserve power to enable the vessel to maintain her schedule speed without difficulty even under unfavorable weather conditions.

Completing the trial program off Rockland the vessel was headed out to sea being gradually worked up to the light draft contract speed of 22 knots. Beginning at 7:00 p.m. the eight-hour fuel consumption trial was carried out at an average speed of 22.22 knots with the turbines developing 33,085 shaft horsepower at 125 revolutions per minute. The course had been set to complete the eight-hour trial off Nantucket lightship. No difficulty was experienced in readily meeting the fuel consumption guarantees. Conditions of the contract required that electric power be included in the horsepower developed. The fuel consumption under these conditions was found to be 0.597 pound of oil per horsepower per hour. The fuel consumption for all purposes per shaft horsepower per hour of the main turbines alone was found to be 0.618 pound. The average actual B.t.u. per pound of fuel oil used was 18,500, the same as the specified standard.

Possesses Excellent Maneuvering Qualities

COMPLETE maneuvering and steering trials, ahead and astern were carried out off Fire island on the morning of the twenty-sixth. All of these tests were completely satisfactory.

Both under full power and cruising conditions the behavior of the vessel met with the unanimous approval of expert and layman. It was demonstrated that she is a smooth running vessel without vibration and noise. From the feel of the ship during these trials it was difficult for anyone on board to realize the high powers and speeds being developed.

It can be said without exaggeration that the sea trials of the MANHATTAN demonstrate that the naval architects have developed in her a form of high efficiency and exceptional seagoing qualities and that the marine engineers have developed a propelling plant comparable to the most recent advances in efficiency.

A royal reception greeted the MANHATTAN on her arrival in New York harbor as America's latest and greatest modern maritime achievement. She was escorted up the harbor by the new United States airship AKRON while army and navy planes maneuvered above her. All

harbor craft from the smallest to the largest saluted this new giant of the American merchant marine. At pier 60, foot of West Twentieth street, North river, the MANHATTAN was met shortly after 6:00 p.m. by Mrs. Alice Longworth, daughter of President Theodore Roosevelt. As she stepped on board Mrs. Longworth was presented a bouquet of roses by Capt. George Fried. Among others at the pier, with Mrs. Longworth to welcome the MANHATTAN to New York, were: her brother, Kermit Roosevelt, president of the Roosevelt Steamship Co., operator of the United States lines; Mrs. Theodore Roosevelt, Sr., widow of the late President; Mrs. Alexander Biddle and P. V. G. Mitchell, vice president of the Roosevelt Steamship Co. Formal delivery to her owner, the United States lines was made at the North river piers of the International Mercantile Marine Co. at noon on July 27.

Labor Cost Is the Chief Item

DISTRIBUTION of the cost of building a ship shows the importance of such an enterprise to labor. Unemployment had reached a serious point, on May 24, 1930 when the contract was signed for the building of the MANHATTAN and her sister ship, WASHINGTON. When completed (the WASHINGTON it is expected will enter service next May) these two ships will have cost about $21,000,000. Direct labor in the shipyard will receive $9,500,000 of this amount; taxes, insurance, inspection fees and freight charges will absorb $1,000,000; materials coming from 43 states of the Union will call for an expenditure of about $10,500,000. In these materials are many items of machinery and equipment ready for installation which in turn required large aggregate payments for labor. No less than 80 per cent of the value of $8,400,000 for such machinery and equipment has been spent in wages. During the building of these ships and their equipment therefore, it is conservatively estimated that a total of $18,000,000 will finally go to the working man without whose productive skill this great enterprise would not have been possible.

For a period of two years the building of these two ships has meant the employment of 2600 men, on an average, within the shipyard itself. During a similar period 3000 men have been employed in many industries in supplying the shipyard with machinery and equipment.

Completion of the MANHATTAN has been accomplished in one year, seven months and 21 days. With appropriate ceremonies the keel of this vessel was laid at the yard of the New York Shipbuilding Co., Camden, N. J. on Dec. 6, 1930. The first three rivets in the keel were driven by Senator Wesley L. Jones of Washington and Senator Wallace H. White, Jr. of Maine, authors of the Jones-White act, and the late Senator Dwight Morrow of New Jersey. Now that the MANHATTAN has actually entered the North Atlantic trade, the first American vessel expressly built for this service in over three decades, the seriousness and persistence of the support of the government in building up an adequate American merchant marine can no longer be questioned at home or abroad.

Mrs. Theodore Roosevelt Is Sponsor

ONE day less than one year after laying of the keel the MANHATTAN was launched on Dec. 5, 1931. For this notable event Mrs. Theodore Roosevelt Sr. was selected as sponsor. As a tribute to the participation of 43 of the states of the Union in the construction of this ship the water used for her christening was composed of equal quantities furnished by the 48 states. The governor of each state made the selection of water from lake, stream or spring of historical significance. And so in a symbolic fashion the entire country united, making the launching of the MANHATTAN a token of our unity in an unalterable purpose to create a merchant marine commensurate to our position in the family of nations.

Launching of T. S. S. MANHATTAN *at the yard of New York Shipbuilding Co., Camden, N. J., Dec.* 5, 1931

T. S. S. MANHATTAN

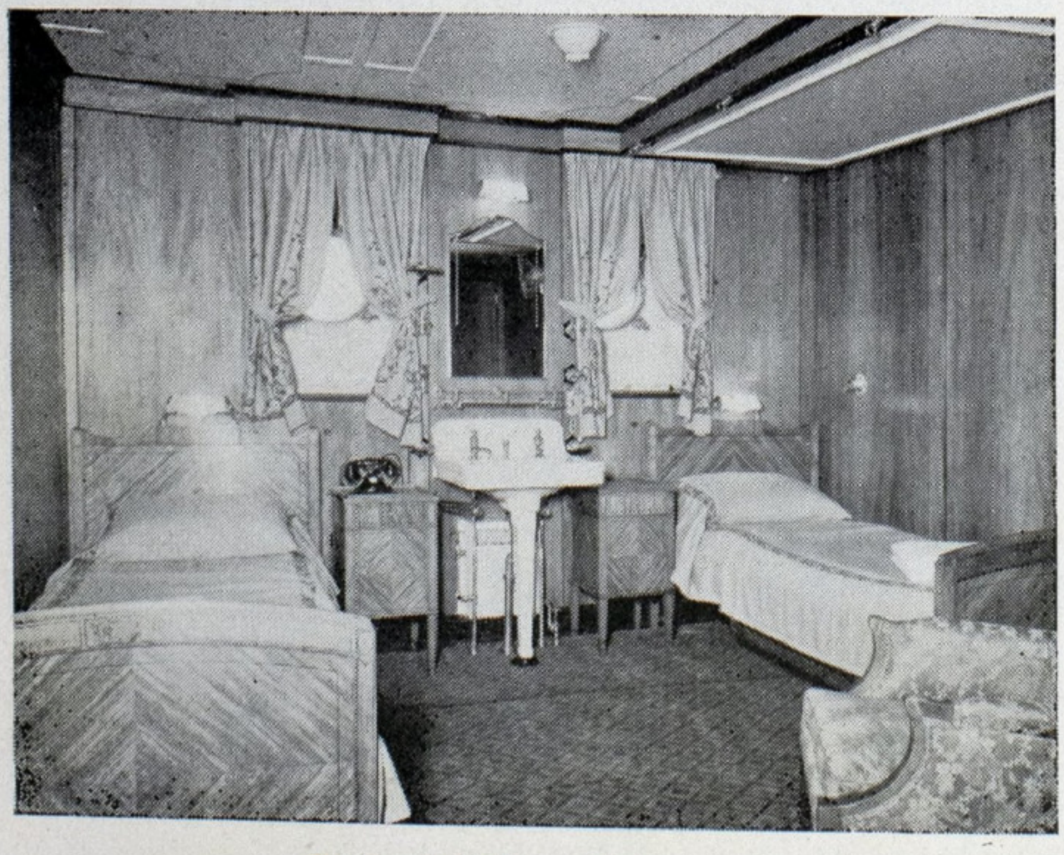
Interior Decoration and Arrangement

IN THE construction of the MANHATTAN the objective was clear that, built by Americans and primarily for Americans, her equipment and appointments should represent the best efforts of the finest craftsmen in the country. This responsibility has ben ably met by The Walter M. Ballard Co. of New York, who received the contract for interior design and furnishing.

The entire promenade deck is devoted to the social side of the cabin passengers. On this deck are arranged one beautiful public room after another. The effect of the layout of this space will be to distribute the passengers as evenly as possible throughout the vessel during the voyage.

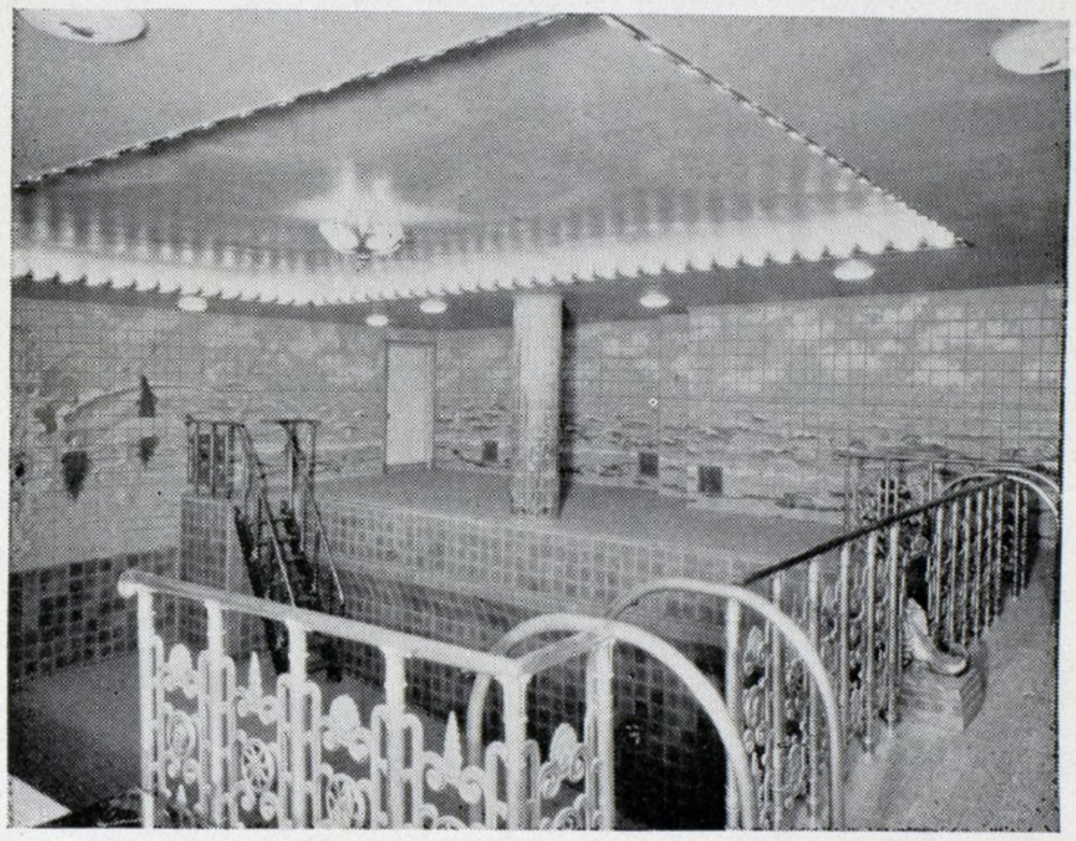
Exits to the promenade deck are arranged at either end or side of the principal public rooms. Outdoor games for the cabin passengers have been provided for on the boat and promenade decks and for the tourist class on B deck. The tourist accommodations are unusually attractive and comfortable. The lounge, dining saloon and smoking room are comparable in their charm and comfort with the similar spaces for cabin passengers. Except that the tourist rooms are somewhat smaller there is very little difference in the staterooms for the two classes.

A number of original features were developed to meet the ideas of the decorators. Disappearing pullman berths have been installed for the first time on a steamship. The unsightly upper berth has been eliminated both in cabin and in tourist quarters. The upper berth stows completely into the ceiling and only two simple motions are necessary to bring it down.



Typical Cabin Stateroom

Wide use of rare and beautiful woods is one of the outstanding features of the decorative plan. Paneled woodwork is used in the lobbies and vestibules, stairways, passage ways and in the cabin and tourist sections. Hand carving for moldings, friezes and medallions and capitals effectively set off the beautifully finished wood paneling in the smoking lounge and grand salon. Wood paneling is also used in the state-



Tile Swimming Pool

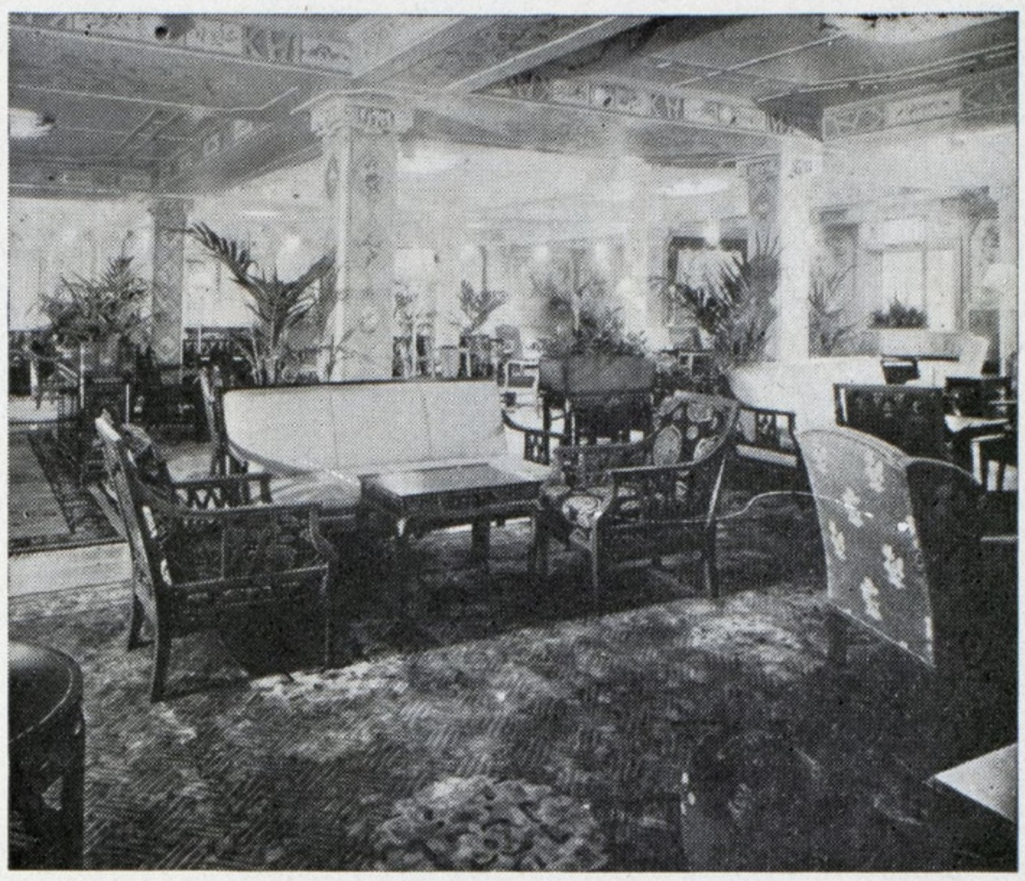
rooms of the cabin class. Beautiful metal work has been applied in the interior design, the product of Oscar Bach, one of America's foremost craftsman in metal.

Another outstanding feature in the decorative plan of the MANHATTAN is the 20 larger and a number of smaller mural paintings all done by Lazzarini, an American citizen of Italian birth. Remarkably effective are the lunettes in the grand salon on the four elements, earth, air, water and fire. The murals of Indian scenes in the smoking room are the result of much research and present a vivid and distinctly American theme.

Public Rooms for Passengers

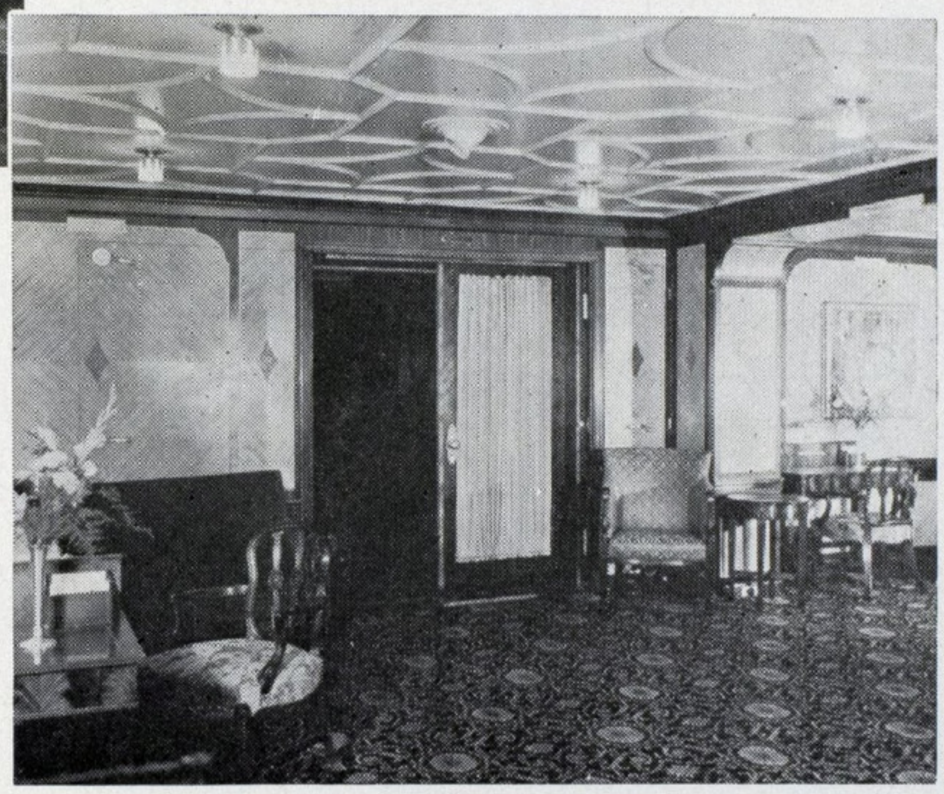
INCLUDED in public rooms of the MANHATTAN are: children's playroom; veranda cafe; cabin smoking lounge; library; writing room; grand salon; palm court; cabin dining room, swimming pool; gymnasium and cabin foyers. The children's playroom is located at the after end of the boat deck, above which is the sun deck given over almost entirely to outdoor

Below, Cabin Smoking Lounge



Above, Palm Court, Cabin Class

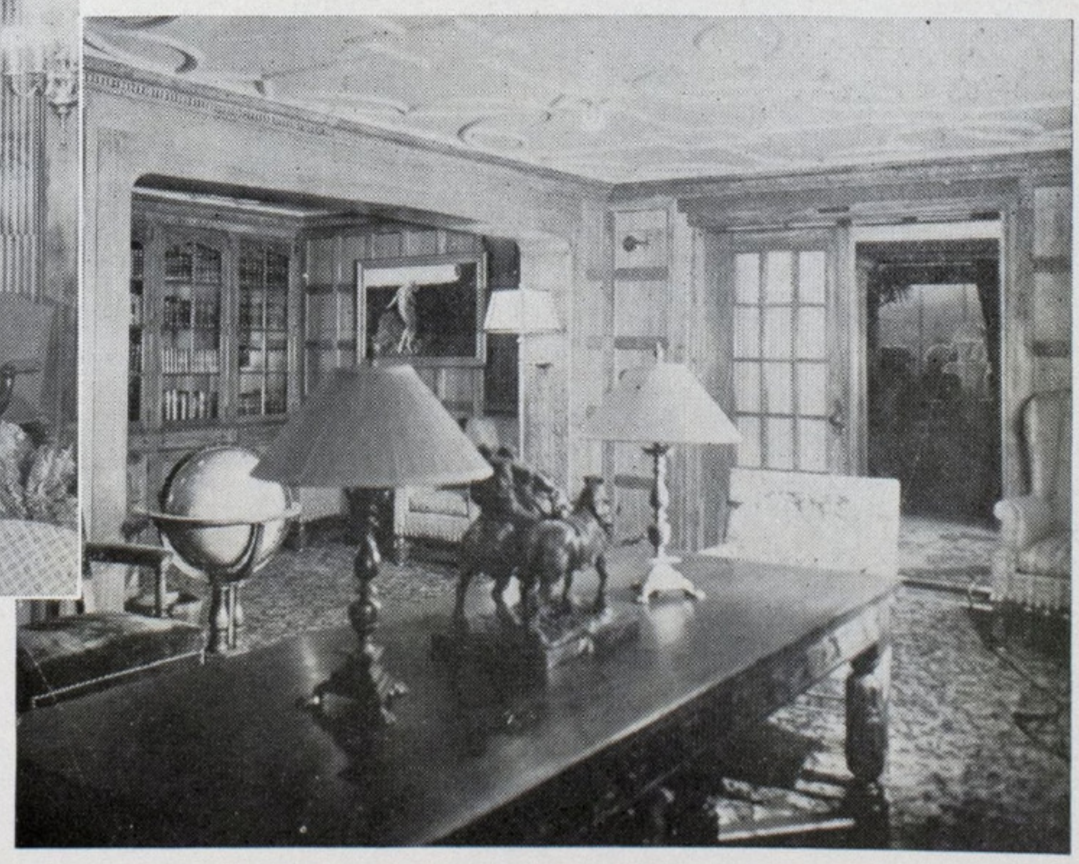
Public Rooms Cabin Class



Above, Cabin Writing Room

Below, Library, Cabin Class

Above, Grand Salon, Cabin Class



games and sports. Adjoining the children's playroom on each side is a roomy play deck enclosed by wire netting. It is believed that this open-air children's play deck is unique in passenger accommodations.

The veranda cafe is the first public space on the after end of the promenade deck. The scheme of decoration is Venetian. There is an oval dance floor in the center surrounded by columns of dark walnut. The narrow windows have a rounded arch separated by the small twisted and painted columns characteristic of this period. Parchment colored plaster walls are decorated with a diamond-trellis pattern in tones of salmon rose and sky blue tooled to give an appearance of age. The ceiling is beamed in dark walnut and the side of the beam faces are painted in small designs of dull reds and blues. Lanterns of amber glass in the form of six-pointed stars, copied from the famous Donnizetti palace hang from the beam.

The atmosphere of the smoking room is dignified but informal. Next to the murals as a striking feature in the architectural scheme is the enormous fireplace across the forward end of the room, formed of limestone blocks fitted into diagonal lines. It is a real wood-burning hearth using huge logs, which is a unique feature on shipboard.

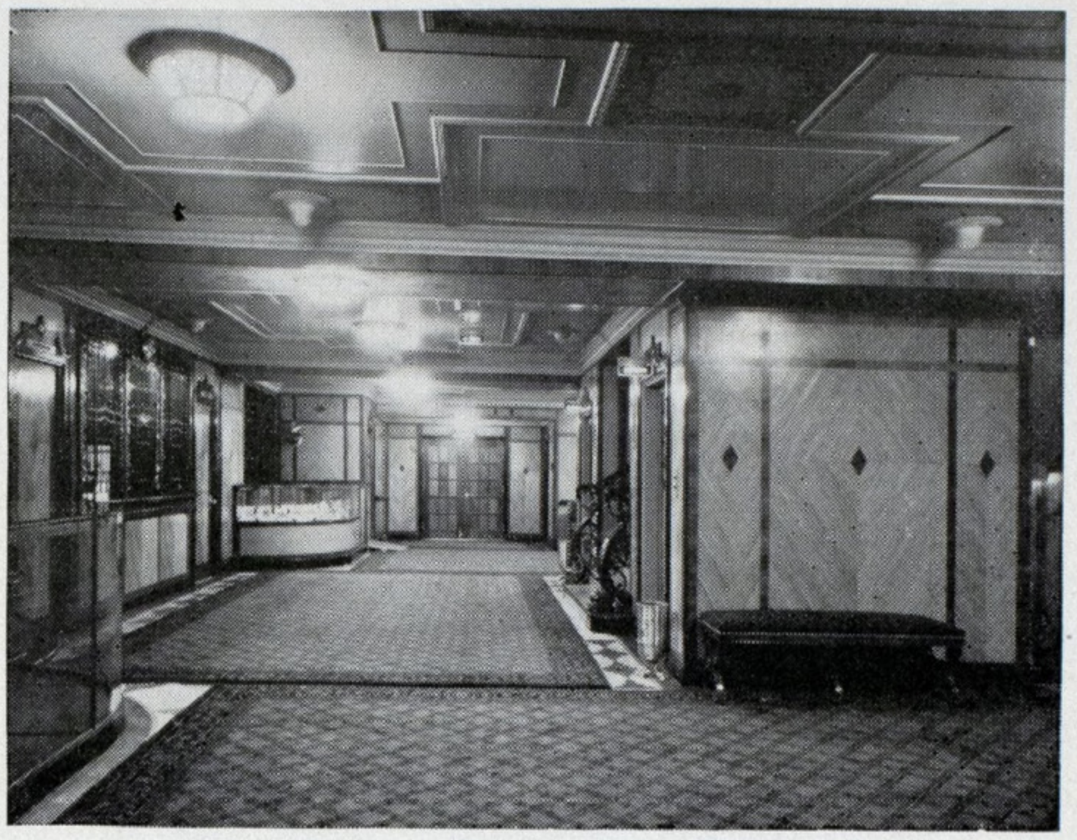
The columns, frieze and beams have been cut in bold designs into which have been rubbed

Spacious Promenade Deck

raw, chalk tones of reds, blues, yellows and greens to give a very effective touch of color. A similar use of inlaid color is noted in the furniture where Indian symbols are used as decoration for the comfortable English renaissance type of chairs, tables and lounges.

Lighting is supplied by hanging lanterns bound in wrought iron. There are small ceiling lights, octagonal in shape flush with the ceiling and covered in primitive silhouettes of men and beasts in black metal.

The library is located on the starboard side



Cabin Class Main Foyer

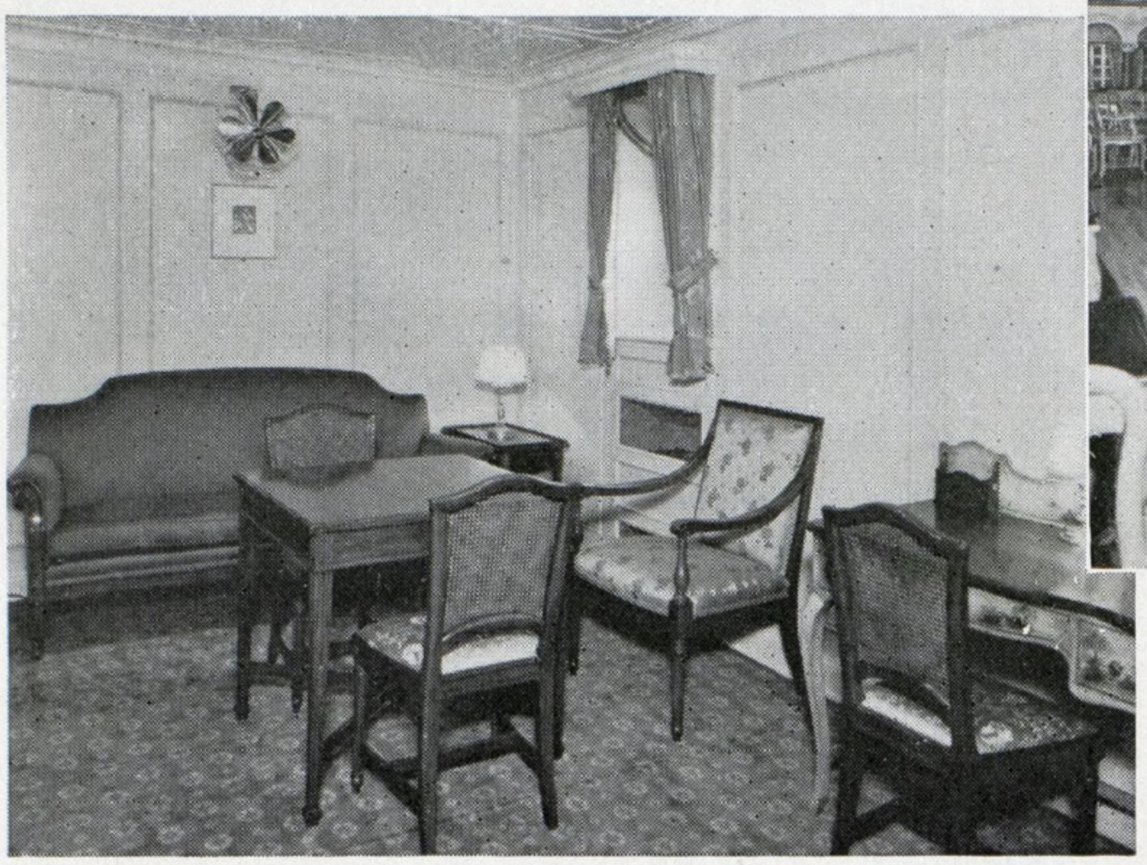
forward of the smoking lounge and separated from it by a vestibule giving on to the promenade deck. It has a quiet, luxurious, restful atmosphere and the Elizabethan Tudor periods are carried out in the design and arrangement. Old English oak paneling in square sections is used for the walls from floor to ceiling. A deep recess in the center of the room provides space for a bookcase with a carved valance of walnut.

The writing room occupies the port side space corresponding to the library on the starboard side. It is done in a modern adaptation of the eighteenth century Hepplewhite style. The walls are faced with matched panels of pale satin wood and walnut with inlays of burl and exotic woods. The writing tables and chairs follow the graceful lines of the period. In the recess corresponding to the one on the library are four desks with individual lights.

Grand Salon Is Two Decks in Height

IMMEDIATELY forward of the library and writing room is an impressive salon. It is two decks in height and has a large shallow central dome. In this room the Georgian style has been adopted as particularly appropriate to the formal social life of the ship. Window recesses on either side provide added floor space and with their pillared entrances give opportunity for an intimate grouping of sofas and lounge chairs. Windows and doorways are separated

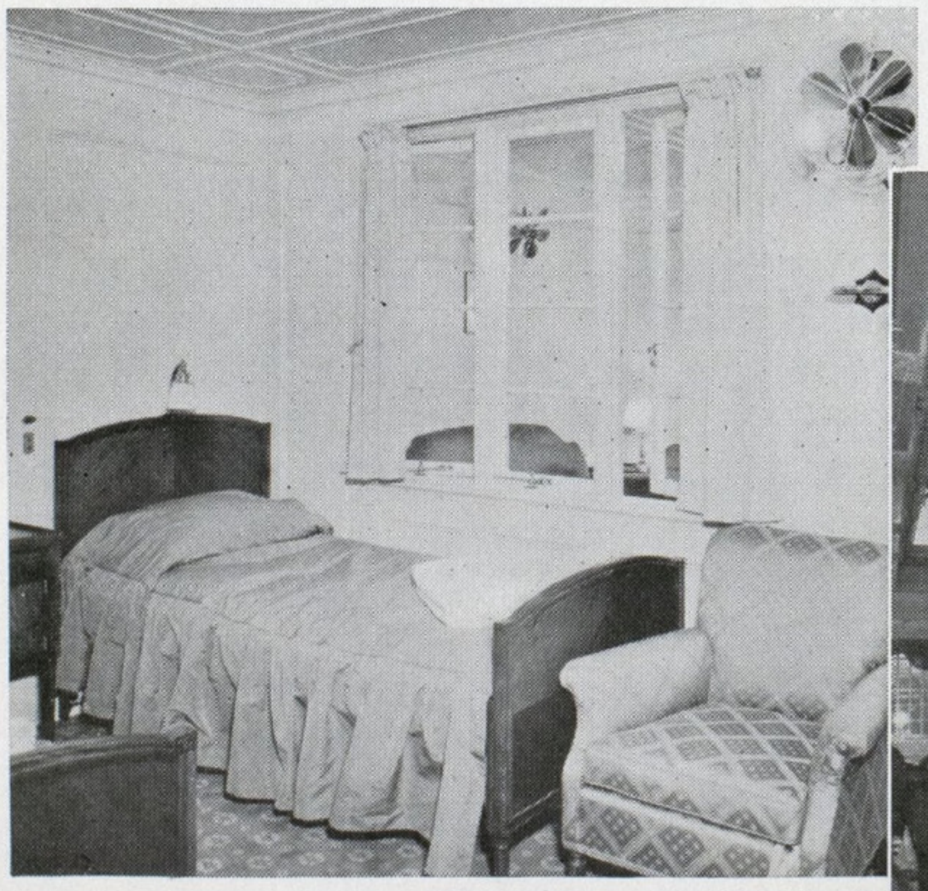
Below, Sitting Room of Cabin Suite



Above, Veranda Cafe, Cabin Class

Cabin Passenger Spaces

Above, Children's Playroom, Cabin Class

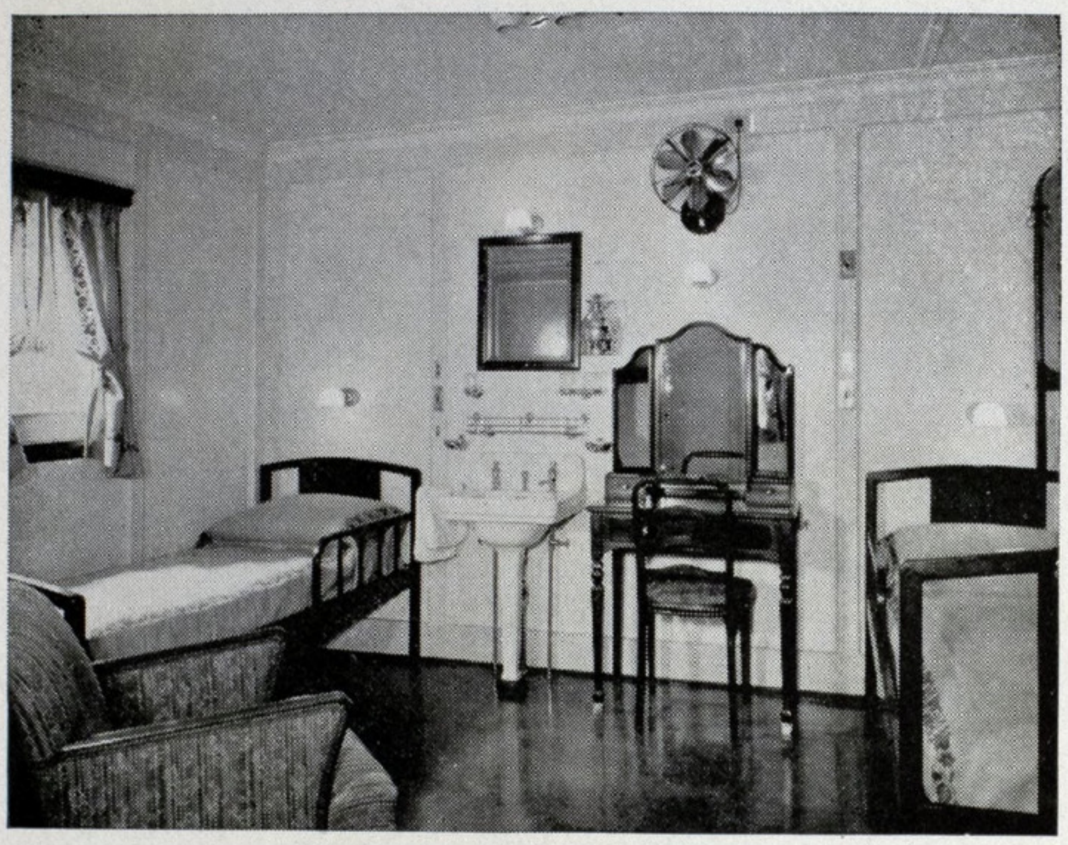


Above, Bedroom of Cabin Suite

At Right, Cabin Dining Saloon

by fluted pilasters of walnut adding height and dignity to this space. In the intervening wall walnut with carved moldings is relieved by touches of antique gold.

A musicians' platform is located at the forward end of the room and the frame of the proscenium arch is richly carved. Central ornamentation of the room is a fine mural painting by Lazzarini, previously referred to which covers the shallow dome. The ceiling panels are set off by moldings of leaf and wreath design, with flat portions bordered in soft rose and blue colorings. Ceiling ventilators are concealed by finely wrought iron grilles by Oscar Bach,



Typical Tourist Stateroom

each holding a lighting fixture. At the after end is a concealed altar.

A complete contrast to the grand salon the palm court is charming and gay in atmosphere. The scheme of decoration is the Chinese Chippendale subjected to French influence. Entire wall decorative covering is the work of Lazzarini, who also painted the 36 Chinoise panels forming the major descriptive motif. Executed in black lacquer colors they are painted on dully gleaming silver and gold canvas. Panels are framed in gold moldings and over each is a gallery light of frosted glass with a small Chinese motif in lacquer red.

The furniture is of French adaptation of the Chippendale style with Chinese fretwork motif. These soft colorings are repeated in the decorations of the beams and the spaces between are done in geometric designs in flat colors. The ceiling lights are in frosted glass in rectangular or octagonal shapes.

Located midships on C deck is the cabin dining salon which is 82 feet by 90 feet with the central section two decks in height. It is done in the green and gold elegance of the court of Louis XVI. Beautifully proportioned wall paneling in cream and ivory tones with a faint suggestion of pastel color is ornamented in gold

Square columns of slender proportions support the large ceiling well through two decks in height. The orchestra balcony with its graceful railing of wrought iron is located across the forward side of the well. At intervals medallions in metal in gilded frames are set in. Large mural paintings by Lazzarini, symbolic of festival, are set in the other three sides of the wall, with the wall space between separated into panels by fluted pilasters festooned with brief designs high-lighted in gold. In the square central section of the ceiling well is another beautiful mural by the same artist on the Judgment of Paris. A carved cornice surrounds the well.

Paneled mirrors are fitted appropriately in the wall panels adding to the attractiveness of the room. A clock is set in an especially designed frame opposite the musicians' gallery in the well. The chairs are of modified Louis XVI type with comfortable seats and backs. In this dining room 420 persons can be seated at one time. The floor of rubber tiling inlaid in symmetrical design of torquoise blue squares and bands of dark blue is a fine example of the most modern type of floor covering.

Rubber tiling is widely used throughout the MANHATTAN in public rooms, passage ways, foyers and stairways. Not only is the quality of the material of the highest order, but the color combinations are particularly pleasing and effective. All rubber tiling was supplied by The Goodyear Tire & Rubber Co. Inc., Akron, O.

Tiled Swimming Pool on D Deck

THE swimming pool on D deck comparing in size with those on the largest liners has an attractive decorative treatment worked out in specially designed colored tiles presenting under-seas scenes. Submerged colored lights give sparkle to the water in the pool and indirect lighting from a cove illuminates the cloud effect of the domed ceiling.

A fully equipped large gymnasium adjoins the swimming pool on D deck. Included in the equipment are the usual apparatus for a gymnasium among which are rowing machines, mechanical horses, pulley weights and wall bars. The same dressing room serving the pool is used by those exercising in the gymnasium.

The main entrance foyer is located on C deck and opening from it are the offices of the purser and steward. From the stairway leading from this foyer there is a beautiful stair rail typical of all other cabin stair rails designed by the Ballard company and executed by Oscar Bach. Newel posts in the form of dolphins are finished in antique gold.

Passenger Cabin Suites

On decks A and B there is a series of 16 rooms en suite providing luxurious accommodations. In these suites on the A deck the living rooms are separated from the bedrooms by full size casement windows of translucent type. There are also private trunk rooms connected with these suites.

The suites are luxuriously furnished with sofas, easy chairs, writing desks and coffee tables in the sitting room, and with two single beds, dressing table with vanity mirror between the two built-in wardrobes, night tables and boudoir chair in the bedroom. Every stateroom in the cabin section is fitted with a French hand-set telephone. The bathrooms are in colored tile and are finished and equipped to correspond to the best hotels.

Cabin staterooms are spacious and beautifully furnished. Paneling in exotic woods is used in every cabin class stateroom on the ship.

Throughout the cabin section, staterooms are furnished with wooden standing beds fitted with specially treated steel springs and with the finest mattresses especially made for the MANHATTAN. In cabin staterooms auxiliary pullman berths are also available. To absorb sound,cork tiling is used beneath the carpeting. Wash stands with fittings of polished white metal are of the pedestal type.

Excellent Tourist Accommodations

IN richness of materials and elaboration of detail only are tourist accommodations materially different from the high standard of the cabin section. Little difference is noticeable in the appearance of luxury and provisions for comfort.

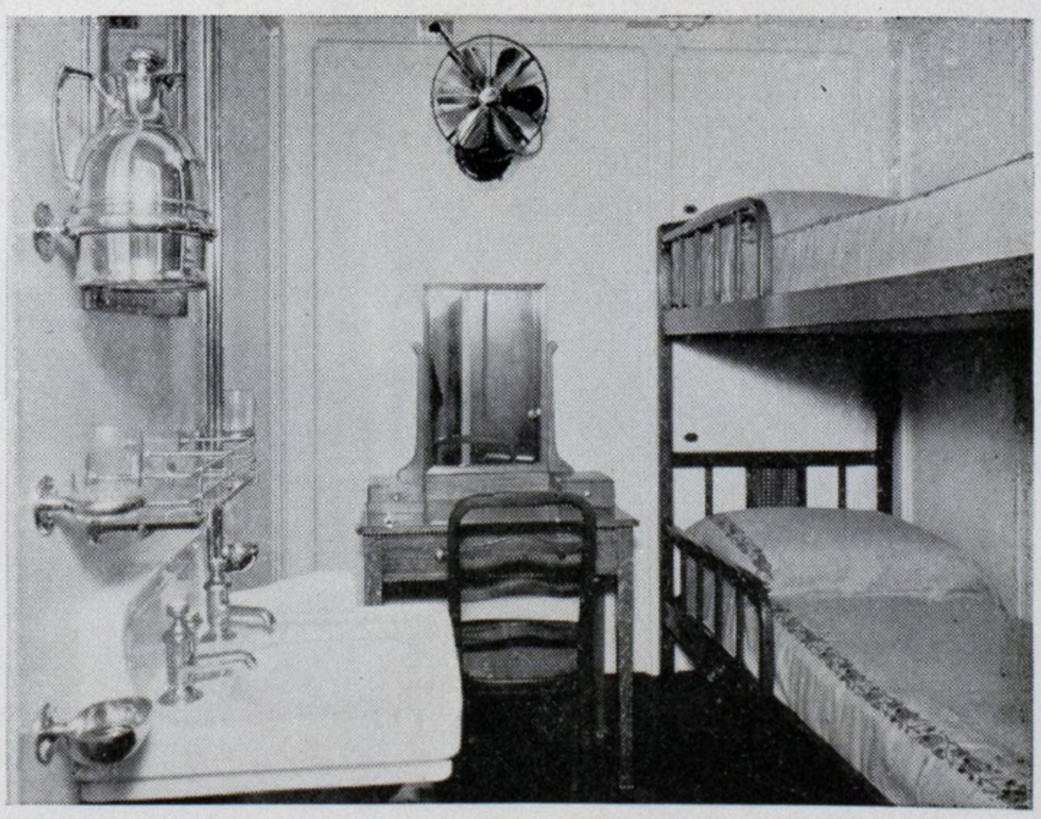
The tourist dining saloon occupies the full width of the vessel and is located immediately aft of the main galley which is used for both dining rooms. The scheme of architecture and decoration is unique in that it is based on the early days in ocean navigation. To carry out this idea the columns and ceiling beams are massive and

Dining Saloon for Tourist Class

the lighting fixtures are quaint while the comfortable chairs and tables are of sturdy construction.

The tourist smoking room occupies the extreme aft end of B deck and the tourist lounge is located immediately forward of this space. The walls of the lounge are finished in pale green and the draperies are of rose colored brocade. Windows of the lounge open onto the tourists' promenade deck. Of the late eighteenth century English period, the furniture consists of comfortable sofas, easy chairs and numerous tables. The lighting fixtures also carry out the same period.

For the tourist smoking room the designers have followed along the lines of an early English tap room. The walls are finished in cross beam effect against a rough cream colored plaster. A bold tile design in red and black is used for the frieze. Lighting fixtures in the ceiling are in the form of cart wheels of wrought iron.



Typical Third Class Stateroom

T. S. S. MANHATTAN

Design and Hull Construction

DESIGNED as a passenger and fast freight ship for service between New York and Hamburg, calling at Cherbourg and Southampton, specifications for the MANHATTAN were prepared with certain agreed upon guarantees, to meet the ideas of owner and builder. To determine the most favorable hull form, model tests, both towed and self-propelled, were carried out at the Model basin at the Navy Yard, Washington. Elaborate strength calculations were made and the most favorable conditions of loading and ballasting determined.

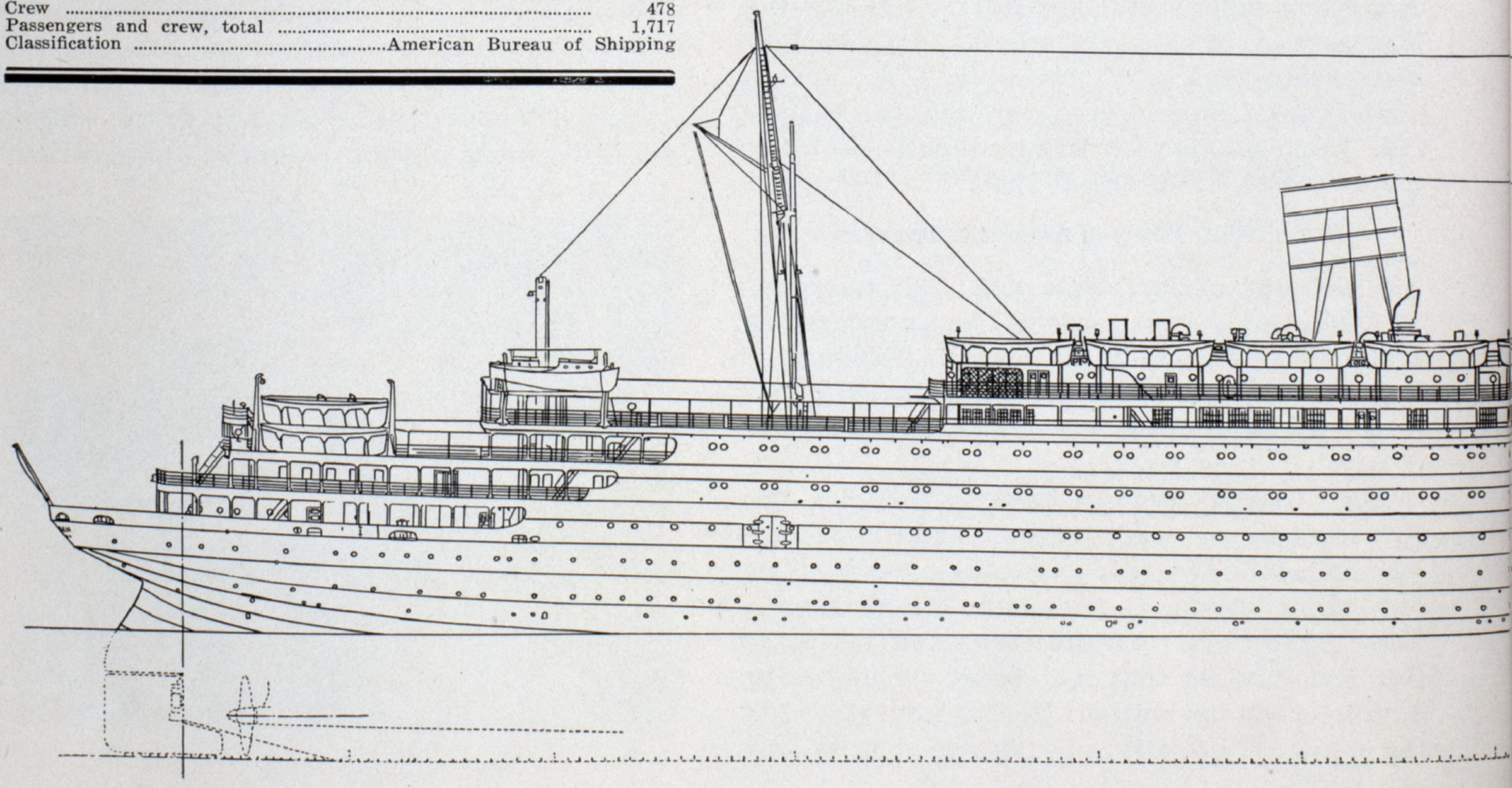
Since a loan of three-fourths of the total cost was advanced by the government, the specifications had to meet the approval of the United States shipping board, as to the general fitness of the vessel for the service intended, and the United States navy, as to her suitability as an auxiliary naval vessel in a national emergency.

The MANHATTAN sets a high standard for safety. Subdivision goes beyond the regulations of the international conference for safety of life at sea (1929), and also beyond the recommendations of the several bulkhead committees here, and abroad. Another feature of safety is the arrangement of the machinery and boiler compartments with the objective of making it possible, in case of damage, for the vessel to reach port safely from mid-ocean. Fuel oil wing tanks in way of the boiler and auxiliary machinery spaces are continued above the full load draft.

Regulations of the United States steamboat inspection service, the United States public health service and the British board of trade have been fully complied with. The MANHATTAN has been built to the requirements of the

General Particulars

Contract signed	May 24, 1930
Launched	Dec. 5, 1931
Delivered	July 27, 1932
Length overall, feet, inches	705 0
Length on waterline, feet, inches	685 0
Length between perpendiculars, feet, inches	666 0
Beam molded, feet, inches	86 0
Depth to C deck molded, feet, inches	47 0
Depth to promenade deck, feet, inches	75 0
Camber C deck and above, inches	 6
Load draft, designed, feet, inches	30 0
Deadweight, designed, on 30-foot draft, tons	12,000
Displacement at 30 feet, 8¾ inches, tons	33,500
Gross tonnage	24,289
Net tonnage	13,924
Speed, normal, in service, knots	20
Shaft horsepower in service	30,000
General cargo, cubic feet	380,000
Refrigerated cargo, cubic feet	47,000
Mail rooms, cubic feet	19,200
Baggage rooms, cabin, cubic feet	8,380
Baggage rooms, tourist, cubic feet	5,450
Baggage rooms, third class, cubic feet	2,040
Ship's cold stores, cubic feet	16,000
Steward's stores, cubic feet	7,900
Bunkers (97 per cent full) tons @ 38 c. f. per ton, tons	4,775
Fresh water (potable) tons	616
Fresh water (ship's use), tons	2,283
Fresh water (reserve feed), tons	680
Fresh water (distilled), tons	248
Passengers, cabin	582
Passengers, tourist	461
Passengers, third	196
Passengers, total	1,239
Crew	478
Passengers and crew, total	1,717
Classification	American Bureau of Shipping



American Bureau of Shipping and under its special survey, receiving this bureau's highest rating, A. I. (E), with free-board for North Atlantic passenger and cargo service.

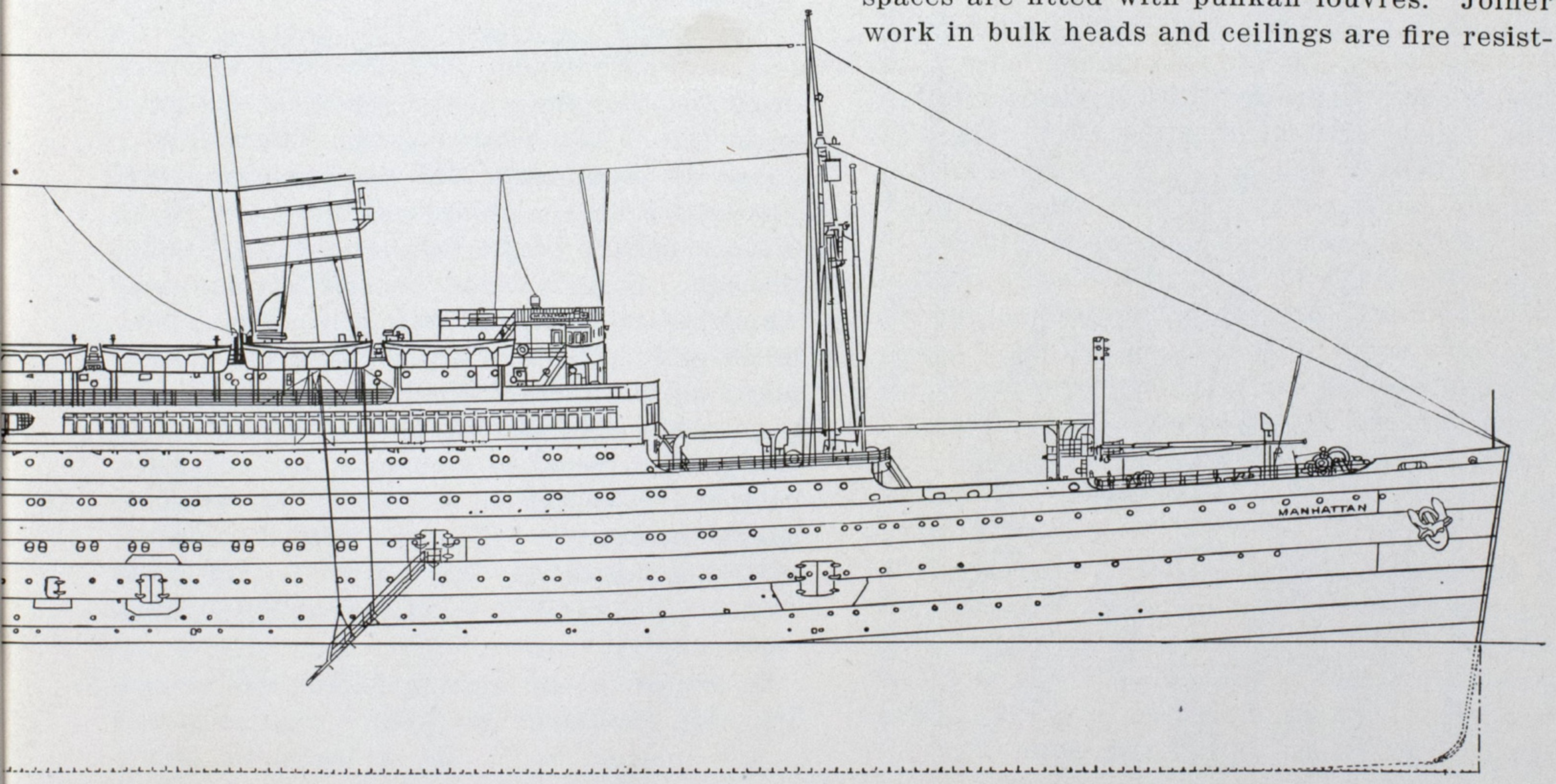
In the design of this vessel, the staff of the New York Shipbuilding Co. deserves great credit for its efficient practical solution of the complex problem involved. It was necessary to work out a type of vessel combining economy in operation with the highest degree of passenger comfort and safety. For a ship of this size, the number of passengers carried in three classes and the cargo cubic and deadweight are larger than usual. Considering the amount of deadweight provided the requirement of a sea speed of twenty knots is a fairly high rating. The load draft is within the limits set for all of the principal ports of the world. More so than many ships designed for definite services, the MANHATTAN, with her generous cargo and passenger capacity and size, is well fitted for a number of different uses in world trade.

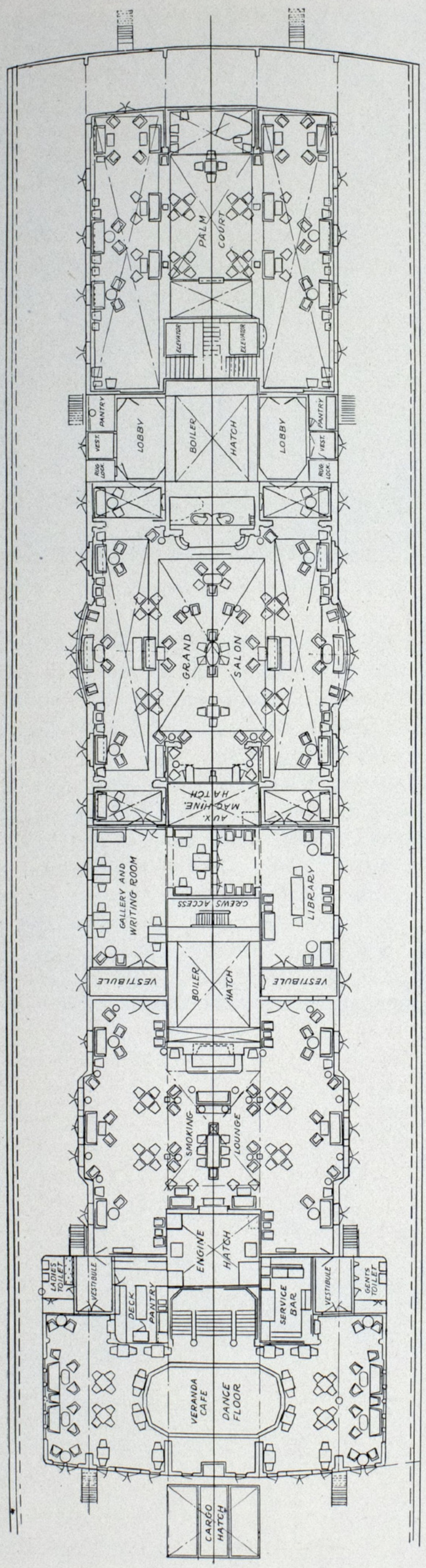
Metallic Lifeboats and Gravity Type Davits

A Comfortable Riding Ship

SHE has a straight raked stem, bulbous bow, and merchant cruiser stern. The rudder is balanced, double plate, and is streamlined. The two stocks are elliptical in shape and widely spaced which with two properly placed masts gives her a pleasing and symmetrical silhouette. Because of her form and flexible loading arrangement, she will prove as her trials have indicated, a comfortable riding ship while at the same time possessing ample stability for safety. The principal dimensions and general particulars have been tabulated for convenience in an accompanying table.

In keeping with the times a number of modern features have been utilized in making the MANHATTAN safer and more comfortable. The dining saloons are always maintained at the most agreeable temperature by an air cooling and purifying system. Staterooms and public spaces are fitted with punkah louvres. Joiner work in bulk heads and ceilings are fire resist-





Layout of the principal public rooms in the cabin class on the S. S. Manhattan on the promenade deck, making a continuous deck promenade possible

ing. For musical programs and radio, loud speakers are installed in the dining rooms and in the public rooms. Steel hatch covers are used on weather decks and longitudinal framing has been adopted for the sun deck. There are no expansion joints in the superstructure.

Every effort has been made in the building of this ship to keep abreast of all modern developments. To insure safety at sea all successful devices known have been installed. In convenience and comfort for the traveler she is equal to the finest hotel or home ashore. Well may all those who have labored with mind and hand be proud of their achievement. The MANHATTAN is not surpassed by any other vessel in her class. In her the world will recognize the high quality of American engineering and craftsmanship.

Some Features of Hull Construction

TRANSVERSE framing is used in the construction of the hull. There are nine decks: sun deck, boat deck, promenade deck, A deck, B deck, C deck, D deck, E deck and F deck. Of these E, D and C extend for the full length of the vessel while B deck extends from a point about three feet aft of the center of the rudder post to the stem, a length of about 670 feet. The A deck has a length of 520 feet and the promenade deck, which is the strength deck over the middle portion, has a length of 405 feet. The lowest deck, F, extends forward of the machinery space and aft only in way of No. 6 hold and the after peak tank.

The ship's sides have a tumblehome of two feet at the promenade deck. However, this deck overhangs the sides of the vessel at this point to the full 86 feet molded width. The boat deck above the promenade deck has a length of 300 feet and the usual height of nine feet is increased in way of the palm court to 10 feet 6 inches. Above the boat deck is the sun deck which has a length of 284 feet. The wheelhouse and chart room are enclosed in the steel house on the forward end of the sun deck. No camber has been used in the decks D to F, while there is six inches of camber in 86 feet for C deck and those above. In calculating the scantlings necessary the ship was treated as an uninterrupted girder to the sun deck. The usual custom was followed in using mild steel throughout.

A few of the interesting particulars of construction may be enumerated. The continuous double bottom is 5 feet 2 inches in depth

throughout except in way of the forward hold where it is increased to 8 feet at the collision bulkhead; lightened solid floors are fitted on every frame, spaced 36 inches apart reduced to 24 inches in way of the peak tanks. Reduction in frame spacing is carried out gradually by one inch forward and two inches aft. Made up in one plate with double straps, the flat keel is 56 inches wide and the vertical keel is watertight, except in way of double bottom tanks Nos. 1, 9 and 10 and is continuous between the peak bulkheads. There are three intercostal side girders on each side of the vertical keel amidships. In addition the oiltight wing longitudinal bulkheads extend for the length of the boiler rooms and auxiliary machinery space.

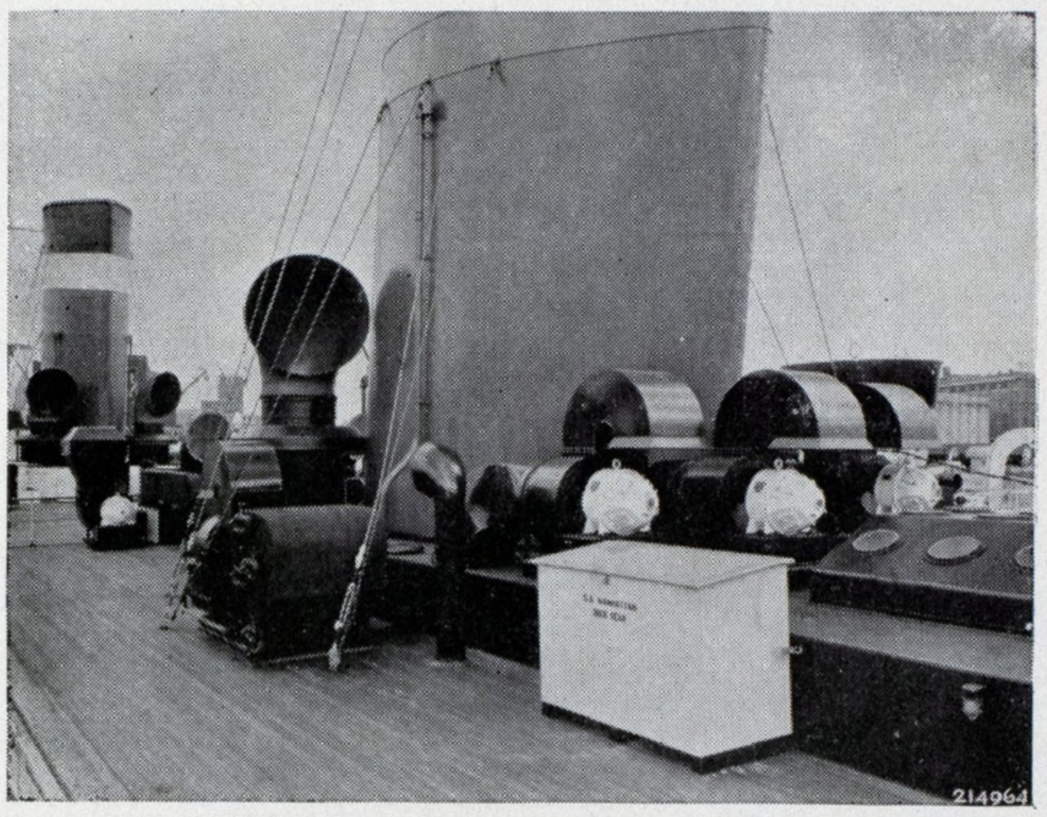
Fuel oil, fresh water, feed water and water ballast are carried in the 17 main tanks into which the double bottom is divided. The plating in the bottom amidships is 38 pounds and the side plating 36 pounds carried up to the A deck. The A deck sheer strake is 34 pounds and the plating to the promenade deck is 32.4 pounds. Buttomhead rivets are used in the shell plating to a depth of about 12 feet below the strength decks in way of three-quarters of the length. Heavy doubling plates are fitted at the breaks of the decks and at all openings in the shell. Bilge keels 15 inches deep are fitted for a length of 250 feet. For side framing 12-inch channels have been fitted to E deck. This framing is reinforced in holds 2 and 3 by 3½-inch reverse bars. Channel frames of 8 inches are fitted above E deck.

Watertight Bulkhead Subdivision

FULLY complying with regulations of international convention on safety of life at sea (1929) there are 11 main transverse bulkheads. Four of the bulkheads in the forward end of the ship are watertight to B deck. The remaining bulkheads are watertight to C deck. Additional subdivision results from the longitudinal wing fuel tanks throughout the boiler and auxiliary machinery rooms, the longitudinal bulkhead extending to E deck. The top of the tanks are three feet below E deck. Fresh water wing tanks in way of the refrigerating machinery space extending up to the tunnel flat and the watertight tunnel flat over the shaft also give additional subdivision. It is conservatively claimed that with three compartments flooded either fore or aft or with four compartments flooded amidships, the ship will remain afloat.

Fifteen horizontal sliding doors 30 inches by 75 inches have been fitted in the main bulkheads in way of E deck. Bulkheads in machinery spaces are served by vertical sliding doors 30 inches by 54 inches. These doors are electrically operated by Cutler-Hammer units mounted at each door. Controls for operating the doors are located at each side of each door and in the pilot house from whence they may be operated separately or in groups as desired. There is also a hand operating gear arrangement which is automatically disengaged when the power unit is in use. Other watertight doors are of standard design with hand operated dogs.

Shaped to suit bulbous bow construction, the stem of the vessel has a cast steel fore foot



Ventilating System, Sun Deck

weighing 3½ tons. The upper part of the stem is of rolled steel, weighing 2½ tons, and with its forward edges well rounded to avoid cutting of lines. The stern post, in three pieces, with a total weight of 43 tons, is a steel casting which together with the stem casting was furnished by the Sterling Steel Foundry Co. The rudder of balanced type is of double plate streamline design with cast steel frame in three pieces weighing 28 tons. The forge steel rudder stock is 24 inches in diameter, weighs 24 tons and was fabricated by the Camden Forge Co. Spectacle frames of cast steel in two pieces weighing 73 tons was cast by the Penn Steel Casting Corp.

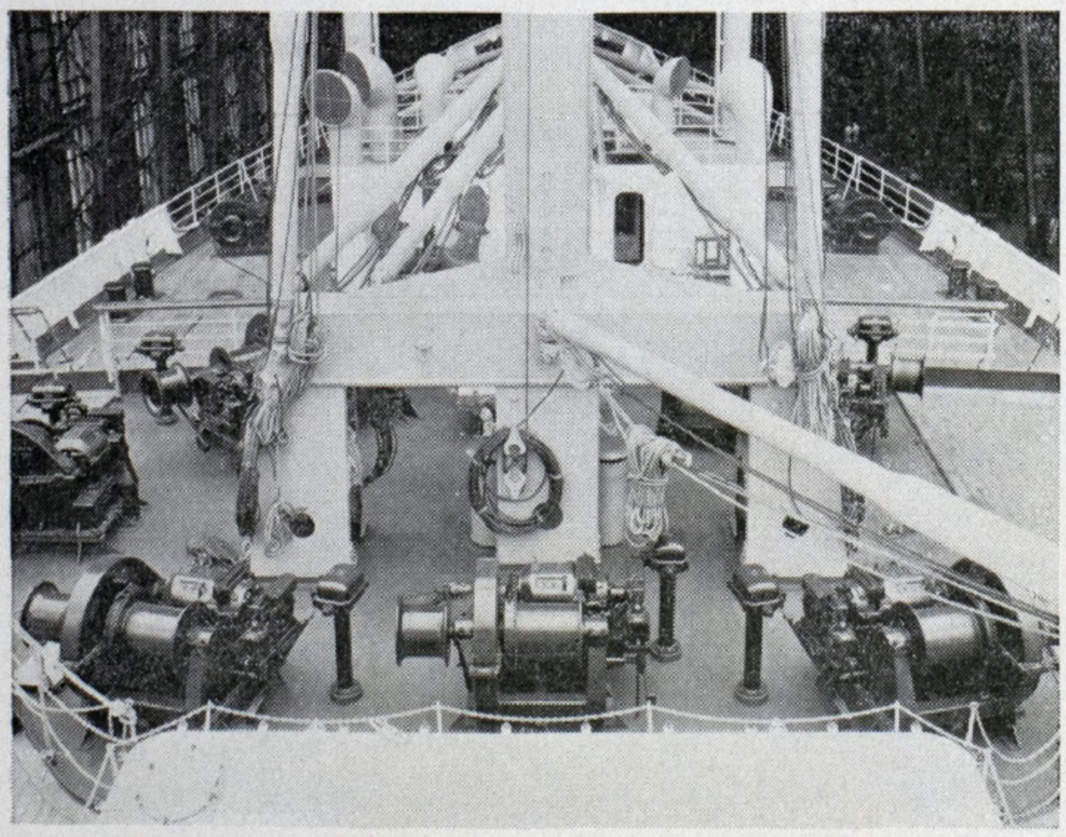
Three large cargo holds are located aft of the forepeak bulkhead. Trunk hatches serve each hold. Quarters for the crew are located on E, D and C decks above the two forward holds. The mail and cabin baggage room, with the swimming pool in the center, are located

over the after hold on E deck. The forward boiler room is separated from No. 3 hold by two large blocks of tanks extending across the ship with a cofferdam between them. Fresh water is carried in the forward and fuel oil in the after tanks. The two boiler rooms are separated by the auxiliary machinery space with interior tanks port and starboard for fuel oil. Fuel oil tanks at the ship's side are fitted in way of boiler rooms and auxiliary machinery

Immediately aft of the after boiler room is the engine room. Aft of the engine room is the refrigerating machinery space and wing tanks for fresh water. The refrigerated cargo holds are located over the refrigerating machinery space on the tunnel flat. The refrigerated ship's stores are located directly above the refrigerated cargo holds. Aft of the refrigerated spaces are two large cargo holds, each served by a trunk cargo hatch. Aft of these cargo holds is the after trimming tank.

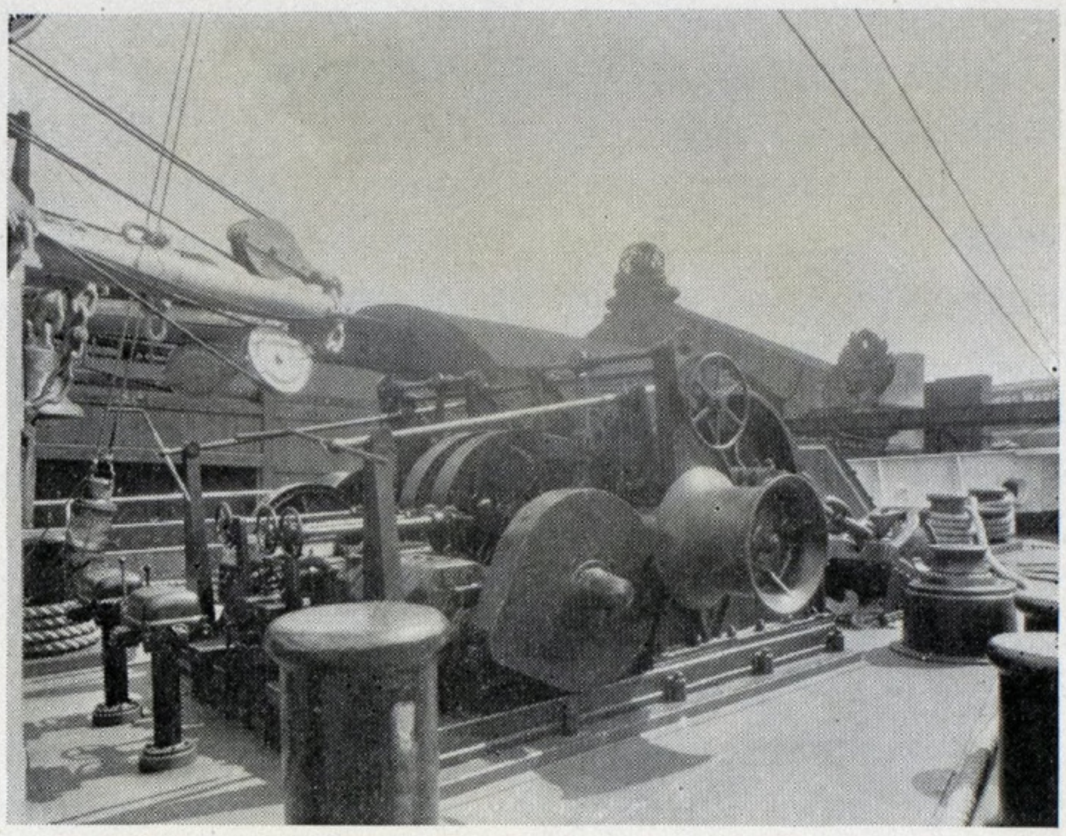
General Arrangement Well Planned

CREW'S quarters, messroom, steward stores and third class and crew's galley are located on E deck amidships. At the after end of this space are third class passenger staterooms and dining room. The steering gear is located in the extreme after compartment. The forward midship section on D deck is occupied by cabin staterooms, swimming pool and gymnasium, while tourist passenger staterooms occupy the remainder of the deck separated from the cabin quarters by a crew working passage. At the after end over the stern is located the auxiliary steering room and crew's quarters.



Electric Driven Winches for Cargo Handling

Amidships on C deck beginning aft is the tourist dining saloon, the main galley and the cabin dining saloon. The entrance foyer and cabin staterooms occupy a space forward of the cabin dining room. Aft of the tourist dining room is the tourist entrance foyer and staterooms. Open air promenade for third class and



Anchor Windlass for 3 7/16-inch Chain Cable

third class lounge occupy the after end of C deck. Cabin passengers staterooms are arranged on A and B decks forward. Tourist lounge, smoking room and promenade are aft on B deck.

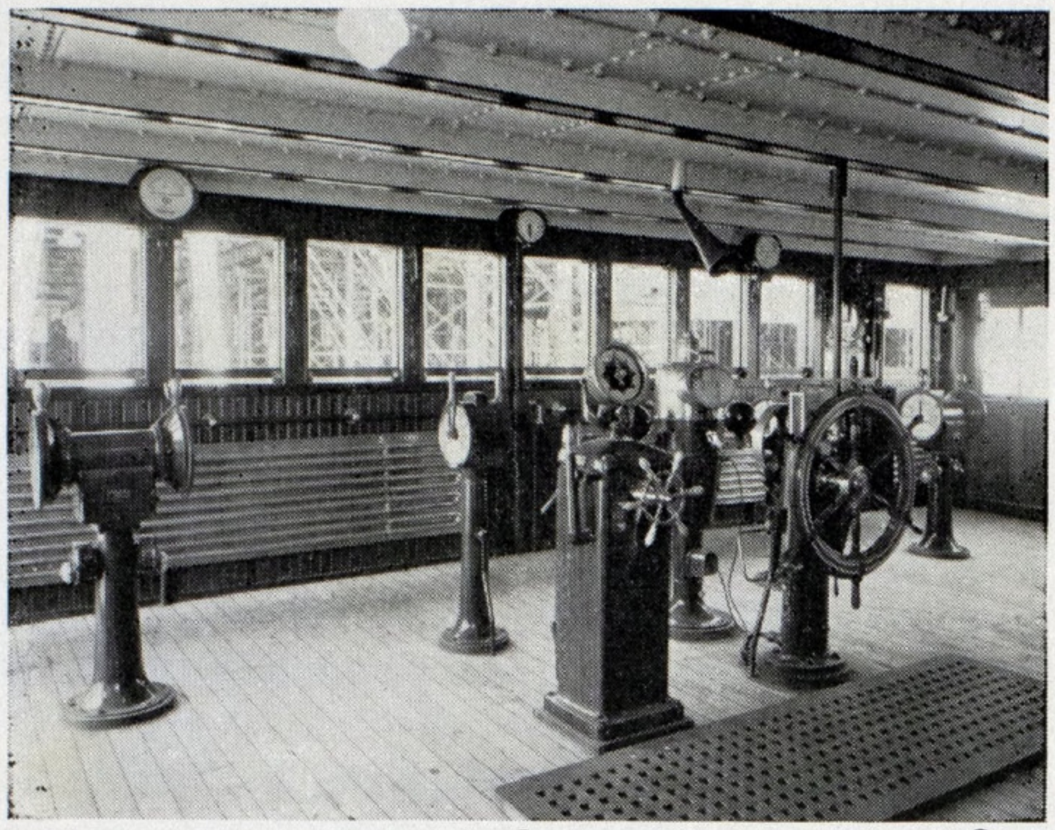
Captain and officers are located on the boat deck at the forward end and the engineers' quarters and messrooms are located aft on the same deck with the children's playroom and play deck at the extreme after end of this deck. Wheelhouse, chart room and navigating spaces are located on the sun deck forward. Between the two stacks is a cabin game deck.

Complete Hull Equipment Installed

EVERY ship must have its equipment of anchors, chain cables, tow lines, hawsers and warps. To meet the requirements of the classification society and of the owner, the MANHATTAN was supplied with the following equipment: Three bower stockless anchors of 20,500 pounds each; one stream stockless anchor of 7805 pounds; 330 fathoms of 3 7/16-inch stud link chain cable; 120 fathoms of 2¼-inch diameter 6/24 wire streamline; 150 fathoms of 2¾-inch diameter 6/37 wire tow line; four hawsers, 120 fathoms each, of 1¼-inch diameter 6/24 wire; two hawsers, 120 fathoms each of ⅞-inch diameter 6/24 wire; three warping lines, 90 fathoms each, of 9-inch circumference manila; and three warping lines, 90 fathoms

each, of 10-inch circumference manila.

Anchor chain cables of "Naco" electric cast steel weighing a total of 222,500 pounds were supplied by the National Malleable & Steel Castings Co., Cleveland, manufactured in their Sharon, Pa., plant. Bower anchors of cast steel



Wheelhouse—Nerve Center of Operation

were manufactured by the Baldt Anchor, Chain & Forge Corp., Chester, Pa. Streamlines and tow lines were supplied by the American Cable Co., Newark, N. J. The manila warps were supplied by the Waterbury Co., New York. Wire rope for rigging was supplied by Williamsport Wire Rope Co., Williamsport, Pa.

Anchor Windlass and Capstans

FOR working the 3 7/16-inch link chain cable the windlass is of the horizontal, spur-geared type with twin electric motor drive. It has two wild cats, two gypsy heads, two slipping clutches and five hand-operated jaw clutches. The windlass and electric motors on a common baseplate are located on the weather deck (E). The windlass was furnished by Allan Cunningham, Seattle, and the two electric motors are of Westinghouse make.

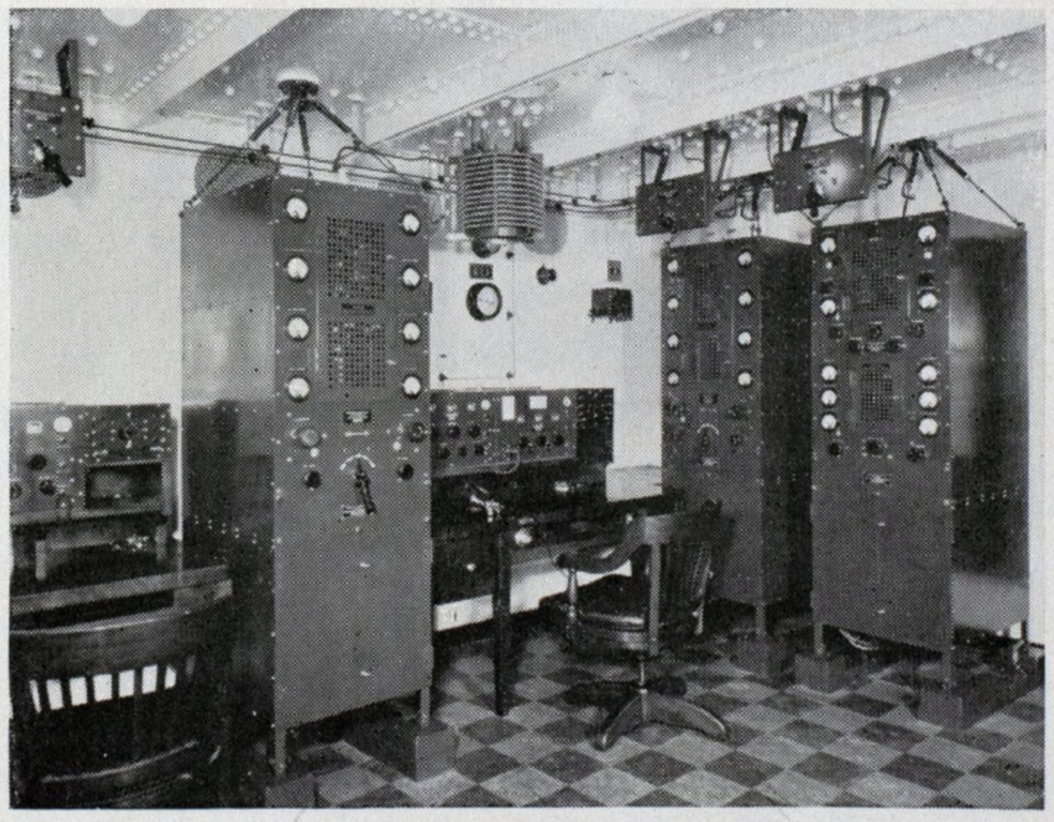
Each wild cat is driven by a single motor and can hoist one anchor weighing 21,560 pounds, with 30 fathoms of chain at a speed of 30 feet per minute. Clutches are provided so that either motor can drive either or both wild cats. However, one motor can only be used on both wild cats when heaving short with moderate load. For both anchors under heavy load conditions each motor with its wild cat is operated independently. The motors, of 90 horsepower at 400 revolutions per minute, arranged for dynamic braking, are enclosed, and watertight.

On C deck aft there are two electrically operated capstans with 25-inch diameter gypsy heads. Each capstan, capable of a 20,000-pound pull, is driven by one 75 horsepower at 600 revolutions, direct current, enclosed type, Westinghouse motor with solenoid brake. There is an additional warping capstan of similar size but with the motor on the same bed plate. The capstans were supplied by the American Engineering Co., Philadelphia.

Steering Gear of Hydraulic-Electric Type

A POWERFUL steering gear of hydraulic-electric type is installed on the MANHATTAN. It has four cylinders and double rams, and was designed and manufactured by the American Engineering Co., Philadelphia. Electric motors and other electrical equipment were supplied by the Westinghouse Electric & Mfg. Co. There are duplicate motor driven pumping units, one serving as a standby. Each unit consists of a Hele-Shaw variable stroke, rotary cylinder, high pressure pump, and is directly driven through a flexible coupling by a 90-horsepower 1000 revolutions per minute, 250 volts, constant speed electric motor.

On D deck above the main steering gear is the auxiliary steering gear of electric motor-driven quadrant type. The quadrant is attached to a 12-inch extension of the rudder stock. It is driven through spur and bevel gearing by a 25 horsepower, 600 revolutions per minute, 250 volts, direct current, constant



Radio Communication Room

speed motor. The quadrant is fitted with suitable lugs for relieving tackles.

Installed into four compartments with a total capacity of 47,000 cubic feet, the refrigerated cargo holds are served through No. 4 hatch.

A refrigerated space of 16,000 cubic feet is located on deck E just above. In this space are rooms for meats, fish, butter, eggs and milk, fruits, vegetables, ice cream and poultry. Insulation is made up with waterproof paper over cork slabs lined with tongue and grooved spruce. At the ship's sides mineral wool has been used instead of cork. The flooring consists of 1½-inch cement laid on lead. Wooden gratings cover the cement.

Modern Refrigeration System Installed

CIRCULATING brine through grids is the method of cooling holds and cold storage chambers. Any compartment can be cooled to any desired temperature. An integral and distinctive feature of the cooling system on the MANHATTAN is the installation for air conditioning the main and tourist dining saloons.

Refrigeration is provided by three CO_2 compressors of single acting double cylinder, vertical, enclosed, electric motor-driven, marine type. Each compressor has a capacity of 37.6 tons for 24 hours and is direct connected on the same bed plate to an electric motor of 115 horsepower. The motor is of variable speed, 230 volts, direct current, marine type, operating at from 250 to 327 revolutions per minute. The refrigerating plant was supplied by the Carrier Engineering Corp., Newark, N. J., and its subsidiary, the Brunswick Kroeschell Co. All of the electrical equipment was supplied by the Westinghouse Electric & Mfg. Co.

For local use the General Electric Co. supplied refrigerators of the following capacities and in the specified locations: Officers' pantry, 6 cubic feet; A deck pantry, 8 cubic feet; promenade deck pantry, 8 cubic feet; B deck pantry, 8 cubic feet; service bar, B deck, 45 cubic feet; and service bar promenade deck, 60 cubic feet. In addition there are three ice cream cabinets and one ice cube storage cabinet suppied by the Frigidaire Corp., Dayton, O.

Complete Cargo Handling Gear

CARGO handling arrangements received careful attention and this equipment is of most modern type for efficient and rapid operation. Beginning at the forward end of the ship: No. 1 hatch is served by four 3-ton booms mounted on kingposts; No. 2 hatch has three 3-ton and one 20-ton booms set on the foremast; three 3-ton booms set on the foremast serve No. 3 hatch; each of hatches Nos. 4 and 5 are fitted with three 3-ton booms set on the mainmast; for No. 6 hatch there are four 3-ton booms mounted on kingposts. All of these booms are served by 3-ton electric winches.

Of these winches 18 are of the motor-driven, single drum, single geared, high-speed type with single winch head. Load and speed characteristics of these winches, all supplied by the Lidgerwood Mfg. Co., New York, are, 6720 pounds at 215 feet per minute; 3500 pounds at 281 feet per minute; 2000 pounds at 323 feet per minute; 1325 pounds at 420 feet per minute; and light line at 700 feet per minute. All of the electrical equipment is of Westinghouse Electric & Mfg. Co. make. The motors are 35 horsepower at 480 revolutions per minute.

For the 20-ton boom there are 18-inch metal quadruple blocks of special extra heavy plate with cast steel sheaves bronze bushed. For the 3-ton booms blocks are metalined bushed with cast steel sheaves. The cargo blocks as well as rigging blocks, etc., were supplied by W. M. McMillan's Sons, New York.

A large quantity of insulation has been used in this vessel. This insulation has been installed to minimize the passage of heat from engine and boiler rooms and to obviate the effects of moisture at the ship's side. It has been installed under decks, in uptakes and at shell plating in way of crew's living quarters. An insulating material called Tucowul, ranging in thickness from four inches to two inches secured in place and covered with galvanized sheet steel has been used on the under side of E deck in way of boiler rooms and inner boiler casing and under decks in way of galleys, pantries and other heated places. In way of engine and auxiliary rooms on the under side of E and D decks, compressed cork 3 inches thick covered with galvanized sheet steel has been used. Compressed cork 2 inches thick has been used on the casings. Where no wood deck is fitted, the under side of B deck and the ship's side is sheathed with one-inch cork slab.

Lifesaving Appliances

SIXTEEN lifeboats in Welin-Maclachlan gravity davits at the level of the sun deck, two lifeboats at the after end of the promenade deck and four lifeboats nested at the after end of A deck constitute the principal lifesaving equipment of the MANHATTAN. In addition there is a full equipment of buoyant apparatus covering 25 per cent of the vessel's total complement consisting of 21 four feet by six feet floats for 20 persons each. These floats are stowed on the sun deck and on A and B decks. All lifeboats, gravity davits and floats were

supplied by the Welin Davit & Boat Corp., 8 Lister avenue, Newark, N. J. A full supply of life preservers and ring buoys are part of the equipment and were supplied by the Atlantic Pacific Mfg. Co., Brooklyn, N. Y.

Of the lifeboats, the 16 on the boat deck are 30 feet x 10 feet 6 inches x 4 feet 6 inches size and each has a capacity of 84 persons. They are built of copper bearing, galvanized steel with steel keel, stem and stern post, fully equipped for ocean service, and are fitted with Mills releasing gear. Except that they are built to stow in tiers of two boats, the four lifeboats aft are identical.

Two motor lifeboats 30 feet by 8 feet 8 inches of 424 cubic feet capacity, each fitted with a four-cycle gasoline engine with starter and reverse gear, capable of eight miles an hour fully loaded have also been installed. Fuel capacity is sufficient for a cruising radius of 200 miles.

For launching the boats, with the exception of those aft on A deck, the Welin-Maclachlan gravity type davit has been installed. The wire falls to boats are served by boat hoisting electrical winches. Electrical motors supplied by Westinghouse serve the boat hoists, being 13½ horsepower for the double coupled winches and 20 horsepower for the single winches handling the motor boats. For the stowed lifeboats on A deck, Steward mechanical davits are used.

Fire Alarm and Protection

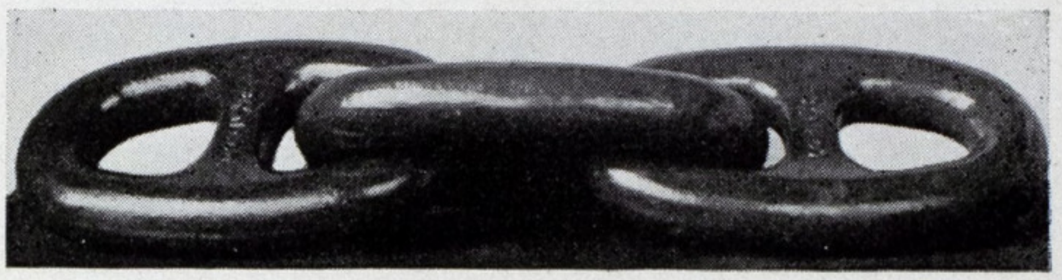
FOR protection of passenger quarters, storerooms, etc., a 36 zone Henschel mercurial thermostat type fire alarm system has been installed. This alarm is automatic and electrically operated and a fire or conditions tending to a fire in any of the spaces served is immediately indicated at a central annunciator in the wheelhouse and by an audible signal in the engine room. Alarm of fire may also be given manually from a number of stations located throughout the living quarters.

For alarm of fire in cargo holds and other closed portions of the ship, outside of living quarters, the Rich smoke detecting system, supplied by Walter Kidde & Co., New York, has been installed. This system indicates a fire and its location by means of a smoke detecting cabinet in the pilothouse. For extinguishing fires of this nature there is a steam smothering system in the cargo holds, refrigerated cargo space, baggage rooms, dry stores, mail rooms and linen storage. Fires occurring in the boatswain stores, lamp room and paint locker are extinguished by a Lux system of CO_2 gas discharging into any compartment.

Throughout the ship in suitable locations there are installed 8 2½-gallon soda acid type and 20 one-quart carbon tetrachloride type extinguishers for the control of small local fires. These extinguishers were supplied by the Buffalo Fire Appliance Corp., Buffalo, N. Y. For the engine room, fire rooms and fuel oil filling room there is installed a foam fire extinguishing system supplied by the American LaFrance & Foamite Industries, Long Island City, N. Y.

All parts of the ship can also be reached by the fire mains carrying water under pressure. For the localizing of fires in passenger quarters there are steel fire bulkheads, about 90 feet apart, extending across the ship.

Collision and alarm bell systems are installed separately for officers and crew and for passenger quarters. These systems are operated from a control panel in the wheelhouse and



Cast Steel Chain Cable 3 7/16-inch Stud Link

consist of six-inch bells located in all parts of the ship. The primary purpose of these systems is to warn passengers and crew in case of danger of collision or other external menace.

Navigating Equipment and Appliances

STANDARD magnetic compasses are fitted on the wheelhouse, in the wheelhouse and on the docking bridge. This equipment is of navy standard type and was supplied by T. S. and J. D. Negus, New York.

The Sperry Gyroscope Co. Inc., Brooklyn, N. Y., has supplied a complete gyroscopic compass system. The master compass operates six repeaters; one on top of the wheelhouse, two in the wheelhouse, one in captain's office, one on port wing of bridge and one on the docking bridge. For automatic steering under gyroscopic compass control, a Sperry gyro-pilot is installed in the wheelhouse with the control unit in the steering gear room.

Other equipment includes a Sperry course recorder, a Kolster radio compass, supplied by Mackay Radio & Telegraph Co. Inc., New York, and a Sperry rudder indicator and rudder angle recorder, Sperry shaft revolution indicator with a comparator indicating visually revolutions per minute, total revolutions logged and rela-

tive speed of the two shafts and revolution counters by Cummings Machine Works, Boston. A fathometer indicating the depth of water below the keel of the ship at all times has been supplied by the Submarine Signal Co., Boston.

Engine telegraphs and signals for docking and steering were supplied by Chas. Cory Corp., New York. For the engine room the electrical order telegraph system includes two engine telegraph transmitters of the pedestal type in the wheelhouse, and an engine order telegraph indicator with reply near each throttle in the engine room. Other parts of this system are the telegraph for docking and steering and electrical fire and telegraph system and a reserve mechanical engine order telegraph system. The Cory company also furnished two Cory-Kent clear view screens.

Direct day and night communication with either side of the Atlantic is possible with the Mackay Radio & Telegraph Co. wireless.

For communication in the navigation of the ship there are two loud speaking telephone systems supplied by Chas. J. Henschel & Co. Inc., Amesbury, Mass. These systems are for communication between the pilothouse, engine room, steering gear room and docking bridge and chief engineer's room and between the pilothouse, crow's nest and forecastle. The Standard Electric Time Co., Springfield, Mass., has supplied a system of electric clocks consisting of a master clock in the chart room, with secondary clocks located in wheelhouse, public spaces, foyers, officers' mess room, radio room and machinery spaces. A radio clock was supplied by the Radiomarine Corp. Other marine clocks for use in the engine room, were made by the Chelsea Clock Co., Boston.

Twin Screw Turbine Geared Cabin Liner Manhattan—Auxiliaries and Equipment

Boilers and Engine Auxiliaries

Six Babcock & Wilcox Watertube Boilers in two firerooms—See section on machinery for full description.

Soot Blowers—Diamond Specialty Corp.

Forced Draft and Heaters—Eight fans and four heaters, B. F. Sturtevant Co.

Turbo-Generators—Four—Westinghouse.

Turbines—For main condenser circulating pumps, B. F. Sturtevant Co.

Feed Water Heaters—Also main stop and emergency valve and maneuvering valve manifolds for main turbines, oil strainers, drain coolers, etc., Schutte & Koerting Co.

Feed Pumps—Two centrifugal, for boilers, DeLaval Steam Turbine Co.

Pumps—Forty-nine, various types, sizes. Worthington Pump & Machinery Corp. Other pumps by Quimby, Nash, Northern. (See text.)

Electric Motors—Westinghouse (See text).

Thrust Bearings—Kingsbury (See text).

Reduction Gears—The Falk Corp. (See text).

Electric Storage Batteries—Eight 12-cell Exide, two each for the following systems, call bell, fire alarm, navigating telephone, and clock system. One 6-cell Exide for each of two motor lifeboats. One 120-cell Exide ironclad for emergency light and power.

Motor Generator Sets—Power for interior communication, Diehl Mfg. Co.

Oil Purifiers—Two, No. 600 DeLaval.

Evaporators—Also lubricating oil coolers, distillers, filters and water heaters, etc., Griscom-Russell Co.

Recording Thermometers—Also absolute pressure gages, Taylor Instrument Companies.

Smoke Indicators—Wager Furnace Bridge Wall Co.

Electrical Instruments—For switchboards, Weston Electrical Instrument Co.

Safety Equipment

Fire Detection—Fire alarm in living spaces, Chas. J. Henschel & Co. Inc. In cargo spaces, smoke detecting system, Walter Kidde & Co.

Fire Extinguishing—In machinery spaces, foam system, American LaFrance & Foamite Industries Inc. For cargo spaces, CO_2 system, Walter Kidde & Co.

Telephones—Loud speaking for navigation; electrical whistle operators for fog, Chas. J. Henschel & Co. Inc.

Navigation—Gyro-compasses, gyro-pilot, 18-inch searchlight, rudder angle indicator, engine revolution indicator, and a salinity indicator, Sperry Gyroscope Co. Inc.

Anchor Chain—Naco cast steel, 330 fathoms, 3 7/16-inch stud link, National Malleable and Steel Castings Co.

Anchors—Baldt Anchor, Chain & Forge Co.

Life Saving—Lifeboats and gravity davits—Welin Davit & Boat Corp. (See text.)

Telegraphs (mechanical, etc.)—Chas. Cory.

Radio Telegraph, Radio Compass—Mackay Radio & Telegraph Co. Inc.

Compasses (magnetic)—Also sounding machine, T. S. & J. D. Negus.

Depth Finder—Submarine Signal Corp.

Ventilation and Refrigeration

Ventilating Fans—Seventy-eight, B. F. Sturtevant Co. (described in text).

Refrigeration—Carrier-Brunswick International Inc., main refrigeration. General Electric local refrigeration. Frigidaire, ice cube and ice cream cabinets. Entire system described in text.

Refrigerator Doors—Jamison Cold Storage Door Co.

Air Conditioning—Carrier-Brunswick.

Electric Fans—1200, Diehl Mfg. Co.

Equipment and Materials

Steering Gear—Main and auxiliary, American Engineering Co. (see text).

Windlass—Allan Cunningham (see text).

Capstans—American Engineering Co.

Propellers—Two 4-bladed, solid, manganese bronze, Cramp Brass & Iron Foundries Co.

Cargo Winches—Lidgerwood Mfg. Co. (text).

Windows—Storm windows and transoms, casement, Kearfott Engineering Co. Windows in children's playroom, tourist lounge and smoking room, American Locomotive Co.

Galley—Edison General Electric Appliance.

Revolution Counters—Cummings Mach. Works.

Marine Hardware—H. S. Getty Co. Special locks, Schlage Lock Co.; Yale & Towne Mfg. Co.

Elevators—Four, Otis Elevator Co.

Valves—Nearly 4000, The Lunkenheimer Co. Other valves by Foster Engineering Co.; The Edward Valve & Mfg. Co.; Leslie Co.; Chapman Co., Consolidated Ashcroft Hancock Co.

Flooring—Goodyear Tire & Rubber Co. Inc.

Deck Covering—70,000 square feet Asbestolith Mfg. Co.

Cork Tiling and Base—On decks as base and tile, in all staterooms; also for insulation purposes, Armstrong Cork Co., laid by Livezey.

Plywood—Haskelite Mfg. Corp.

Fibreboard—The Pantesote Co. Inc.

Show Cases—Charles C. Geissler.

Furniture—Cooper-Williams Inc.

Clock System—Standard Electric Time Co.

Clocks (engine room)—Chelsea Clock Co.

Steel Castings—Misc., Deemer Steel Castings Co.; Atlantic Steel Castings Co.; Dodge Steel Co., Standard Steel Casting Co.

Steel Castings—Spectacle frames, patterns, Penn Steel Castings Corp.; Stern frame, stem and rudder frame and patterns, Sterling Steel Foundry Co.

Forgings—Camden Forge Co.; Erie Forge Co.; Midvale Co.

Nonferrous Metals—American Brass Co.

Anti-Slip Treads—American Abrasive Metals.

Talking Pictures—Radio—Electric Research Products.

Print Shop—American Type Founders Co.

Manila Rope—Waterbury Co.

Wire Rope—American Cable; Williamsport.

Aluminum Products—Aluminum Co.

Paints—Amalgamated Paint Co.

Bronze Castings—American Manganese Bronze.

Radiators—American Radiator Co.

Ornamental Metal Work—Oscar B. Bach.

Pipe Fittings—Crane Co.

Telephone System—Graybar Electric Co.

Lead Flooring, Pipe—National Lead.

Desk Lights—Lovell-Dressel Co.

Rigging Blocks—W. H. McMillan's Sons.

Sanitary Fixtures—Mott Co.

Steel Pipe—National Tube Co.

Plate Glass, Etc.—Pittsburgh Plate Glass Co.

Joiner Work—Pusey & Jones Corp.

Iron Pipe—Republic Steel Corp.

Stern Bushings—Centrifugal Cast Bronze, Shenango Penn Mold Co.

Fixtures (Lighting)—For public spaces and staterooms, Sterling Bronze Co. Inc.

Whistles, Etc.—Star Brass Mfg. Co.

Furniture, Murals—W. & J. Sloan.

Beds, Springs, Etc.—Simmons Co.

Lubricating Oil—Tidewater Oil Co.

Floor Plates—Alan Wood Steel Co.

Pianos—Eight, Steinway & Sons.

Propulsion Units, Auxiliaries

BASED upon experienced marine engineering the propelling machinery of the MANHATTAN was designed, built and installed by the New York Shipbuilding Co. The propelling plant is rugged, commercially sound and is the equal in efficiency, if not superior, to any machinery in this class up to the present time. It is a twin screw installation, each propeller being driven by one set of single reduction geared turbines of the Parsons type. The total normal output continuously at sea is 30,000 shaft horsepower to maintain a speed of 20 knots in moderate weather. Reserve power is provided so that the schedule set may be maintained under service conditions. A total of 34,500 shaft horsepower can be efficiently developed.

Layout of machinery spaces, including boiler rooms is indicated on the accompanying plan. There are two sets of triple series turbines direct connected to the propeller shaft through single reduction gearing. In each set the component parts are a single flow high pressure turbine, a single flow intermediate pressure turbine and a double flow low pressure turbine. Each turbine in a separate casing drives its own pinion through a flexible coupling. Each turbine is fitted for astern power.

Astern power is equal to 65 per cent of the total ahead power.

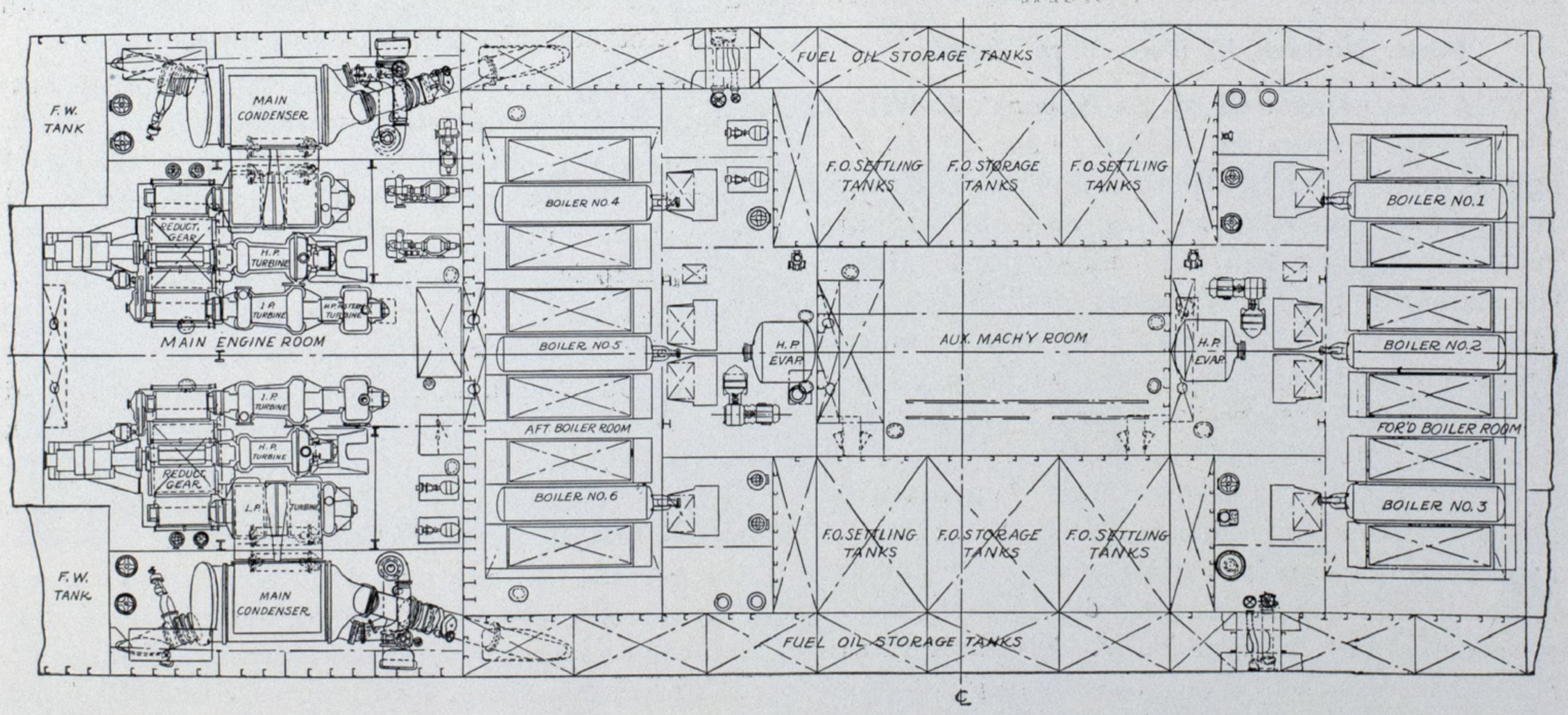
Steam conditions for the high pressure turbine inlet is 390 pounds per square inch absolute, with a temperature of 650 degrees Fahr. At a propeller speed of 125 revolutions per minute the turbine speed is about 1500 revolutions per minute, developing the normal power in each unit of 5000 shaft horsepower.

If it is desired to eliminate the high pressure turbine from the series, live steam can be admitted under reduced pressure to the intermediate pressure turbine and the set operated as a compound unit.

For the high pressure turbine the casing is of cast steel. Corrosion resisting rolled steel is used in the impulse and nozzle blades, finely machined to shape. The blading is fitted into dove tailed grooves and shroud bands are riveted in place. The reaction blading of the end tightening type is of manganese copper, and hard drawn brass is used for all the regular reaction blading. Nozzle rings are made of steel of a patented built-up design. A Kingsbury thrust bearing is fitted to take up the unbalanced thrust.

Single Reduction Main Gearing

SINGLE reduction, double helical reduction gears were supplied by The Falk Corp., Milwaukee, and are of the company's standard type. The gears are the largest ever built in this country for marine turbines, with a diameter of 163 inches and an overall width of face of 76 inches, including a gap 14 inches wide for



Layout of propelling machinery space, boiler rooms and the auxiliary machinery room on the S. S. Manhattan

the center bearings of the pinions. These gears were produced from a special grade of steel.

The three pinions of the respective turbines in each set mesh with one main gear which transmits 15,000 horsepower to the propeller shaft at 125 revolutions per minute.

For lubrication purposes 13,000 gallons of Tycol lubricating oil has been placed on board, supplied by the Tidewater Oil Co., New York.

The main propeller shaft thrust bearings are of Kingsbury type and were supplied by the Kingsbury Machine Works Inc., Philadelphia.

On each propeller shaft is fitted a four-bladed solid manganese bronze propeller cast to true pitch without machining. These propellers were furnished by Cramp Brass & Iron Foundries Co., Eddystone, Pa. The diameter is 19 feet; design pitch is 20 feet and the design projected area is 108.83 square feet.

Each propelling unit is served by an independent main condenser of single pass type. It is located outboard in way of the low pressure turbine. The cooling surface in each condenser is about 16,500 square feet. Tubes are made of Ambrac metal of not less than 30 per cent nickel. They are ¾-inch in outside diameter and are of No. 16 B. w.g. in thickness and are secured in the inlet end by expanding and at the outlet end with ferrules and packing. The shells are made of steel with riveted steel flanges for securing tube sheets and trunks. For service at sea, scoop circulation is provided while for low powers and harbor use there are circulating pumps. A vacuum of 29 inches can be maintained while operating at full power and with 70 degrees Fahr. circulating water.

Main Boilers in Two Fire Rooms

STEAM is generated by six Babcock & Wilcox express watertube boilers, each of 10,500 square feet boiler heating surface, 2507 square feet of super heating surface and 8207 square feet of air heating surface, making a total, for the six boilers, of 63,000 square feet boiler heating surface, 15,042 square feet, super heating surface and 49,242 square feet, air heating surface. The boilers are built for a working pressure of 409 pounds per square inch.

Super heaters of inter-deck type, amply shielded from the radiant heat of the furnace, are located entirely within the boiler casing. At maximum power the total design steam temperature is 682 degrees Fahr. The boilers are similar in design to many that have given complete satisfaction in naval vessels.

They are arranged in two fire rooms of three boilers each, one forward and one aft of the auxiliary engine room. In case of emergency, each fireroom may be operated independently.

Each boiler is equipped with ten double front Babcock & Wilcox mechanical atomizing oil burners of the Cuyama design operating under forced draft using a closed fireroom.

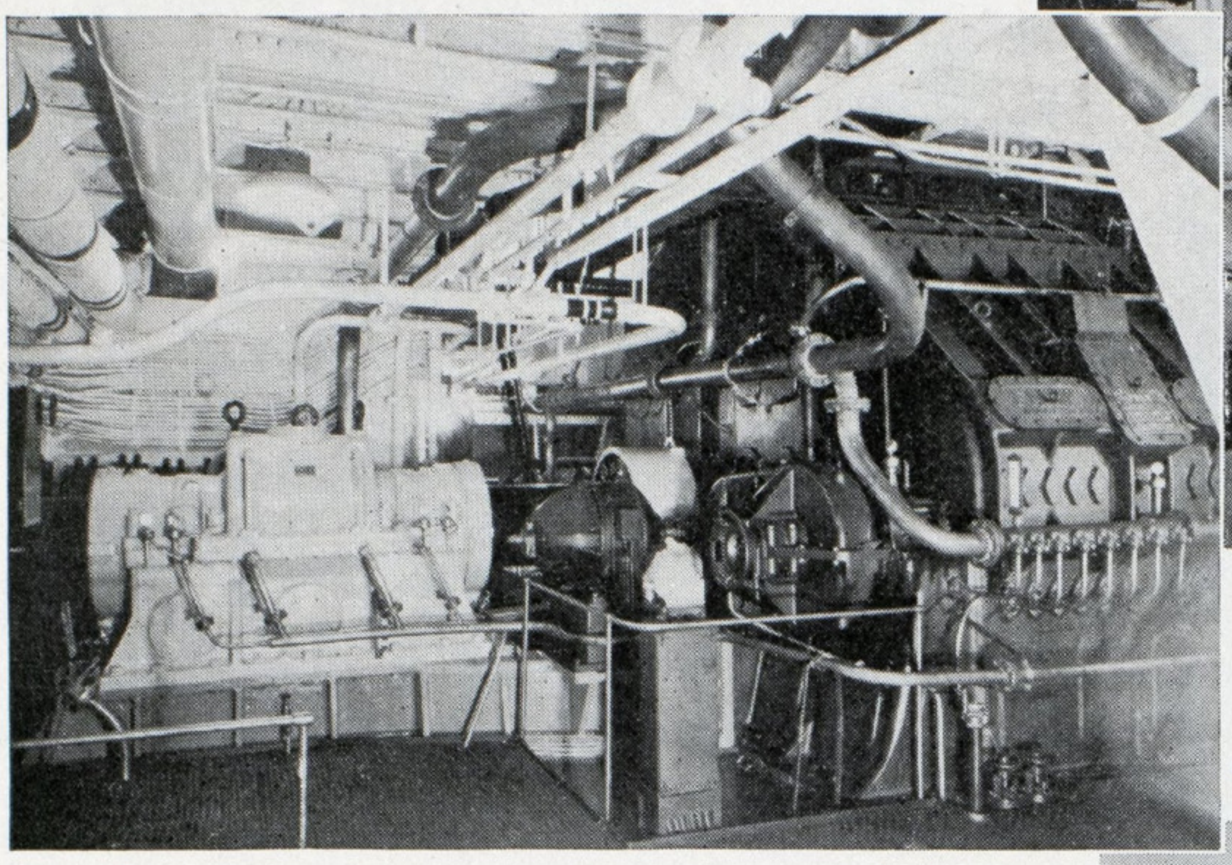
Each steam drum is fitted with two safety valves and each super heater outlet, with one safety valve of Consolidated Ashcroft Hancock type. Boiler stop valves are of Lunkenheimer make and are of extra heavy cast steel. In the front end of each steam drum there is one main and one auxiliary combined feed stop and check valve. Installed in each fireroom is a permanent Ranarex CO_2 indicator and recorder system supplied by the Permutit Co., New York.

Auxiliary Machinery and Equipment

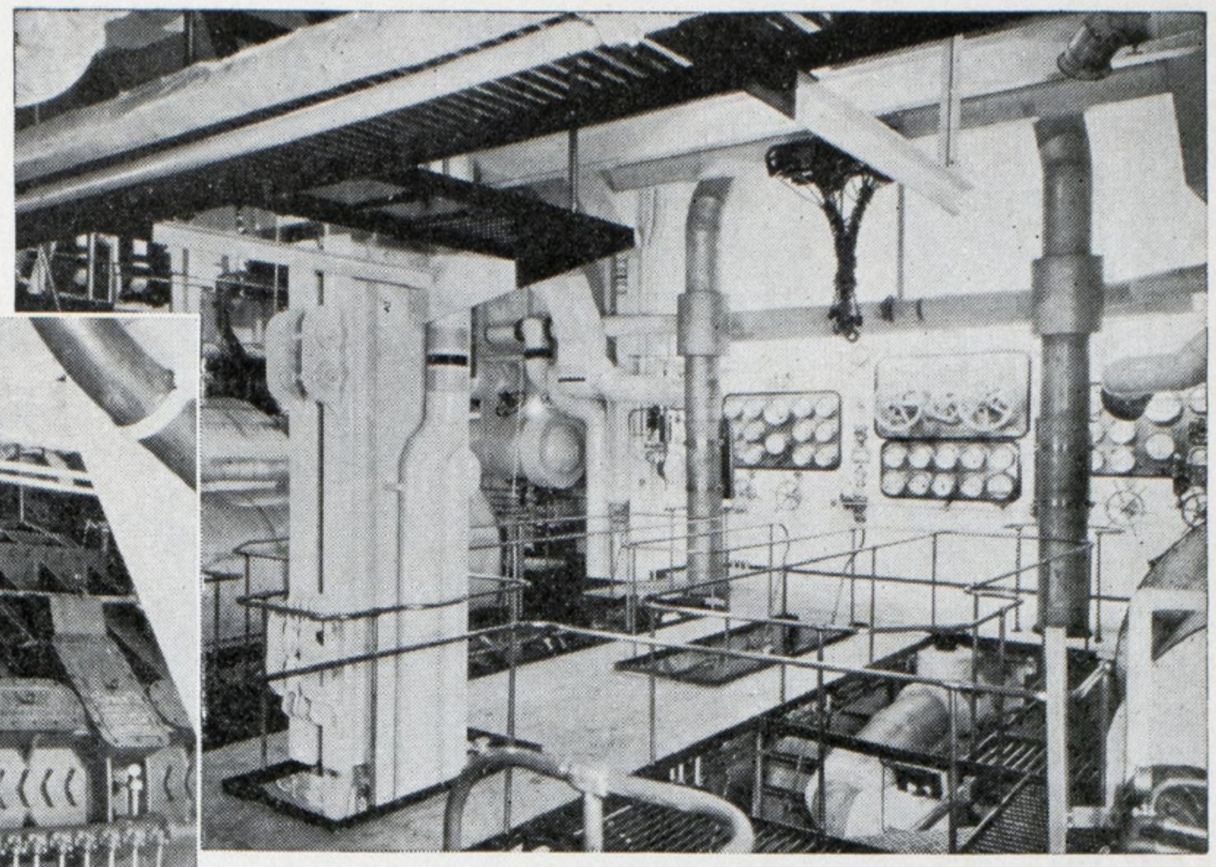
UNIQUE in marine equipment are two high pressure evaporators designed by New York Shipbuilding Co. and built by the Babcock & Wilcox Co. One is installed in each fireroom for supplying low pressure steam to fuel oil heaters, fuel oil heating coils, heating systems and galley. These evaporators are also connected to the main and port feed water heaters and the main and dynamo condensers for making up the supply of distilled boiler feed water as no reserve feed water is used in boilers.

Eight motor driven forced draft fans supplied by B. F. Sturtevant Co., Boston, supply the air to the main boilers through trunks extending to vent cowls on the fidley top. There are four fans for each fireroom and each fan has a capacity of 20,300 cubic feet.

De Laval Steam Turbine Co. supplied two main and one auxiliary feed pumps of centrifugal type, turbine driven. The main feed pumps each have a capacity of 630 g.p.m. at 500 pounds pressure; the capacity of the auxiliary pump is 100 g.p.m. at 500 pounds pressure. The two fuel oil service pumps and one fuel oil transfer pump were supplied by the Quimby Pump Co., Newark, N. J. These pumps are of the vertical screw type with a capacity in each of the service pumps of 34 g.p.m. at 300 pounds pressure and of the transfer pump, 500 g.p.m. at 75 pounds pressure. They are electric motor driven. One motor driven rotary gear pump for starting purposes and for transferring diesel oil was supplied by the Northern Pump Co., Minneapolis, Minn. Two motor driven bilge and ballast pumps of horizontal centrifugal self-

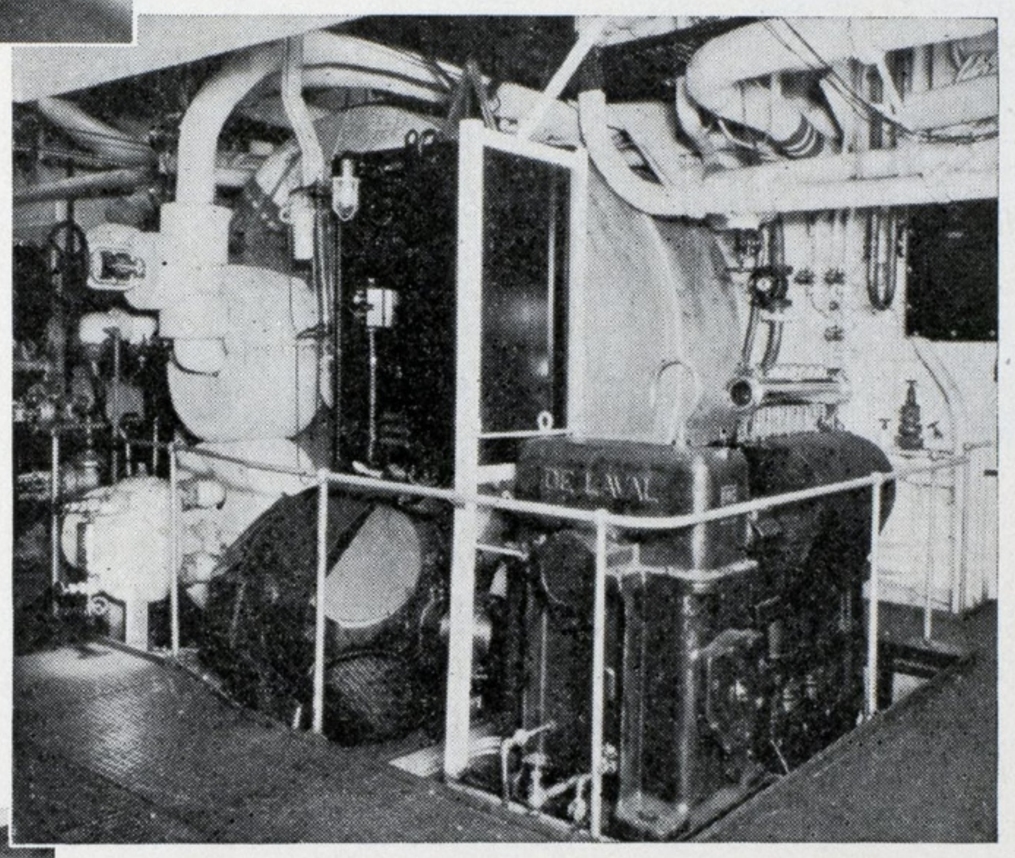


Below, Reduction Gearing and Thrust



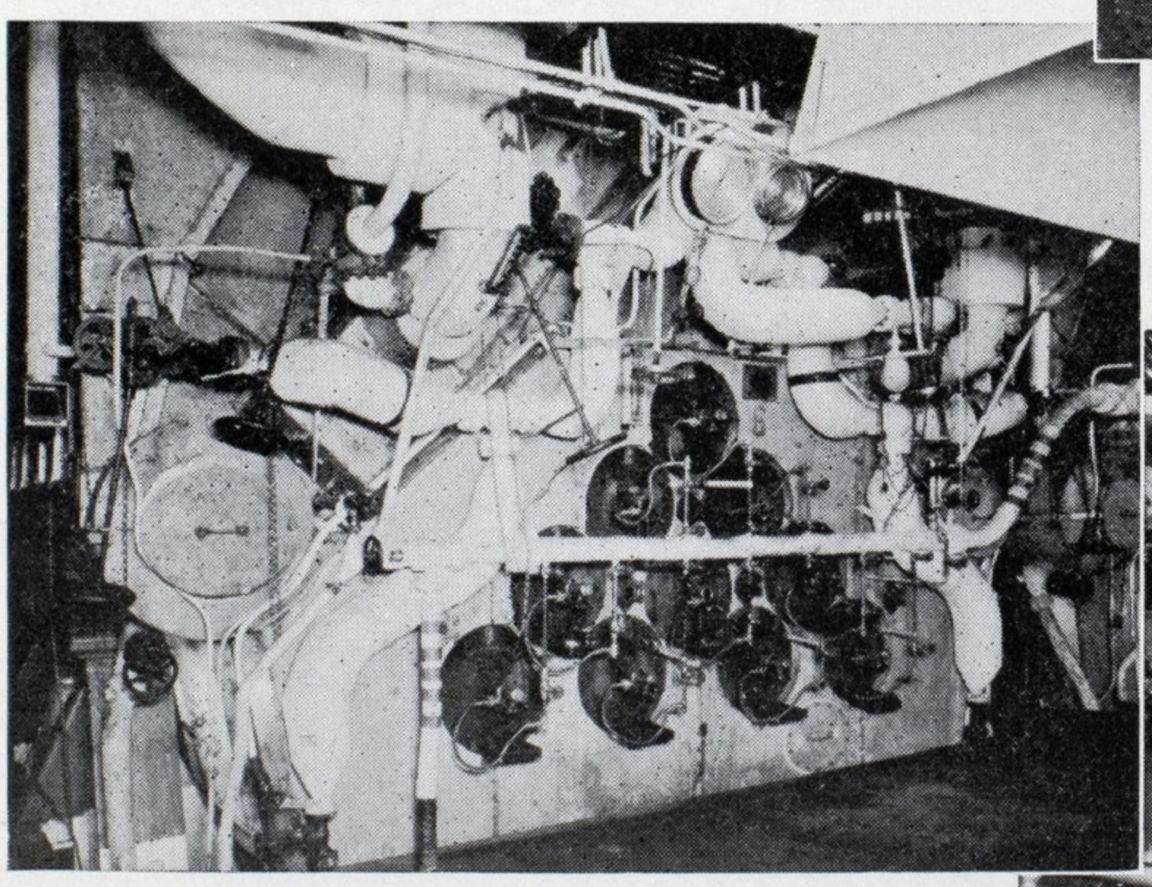
Above, Operating Platform Engine Room

Propelling Units, Machinery

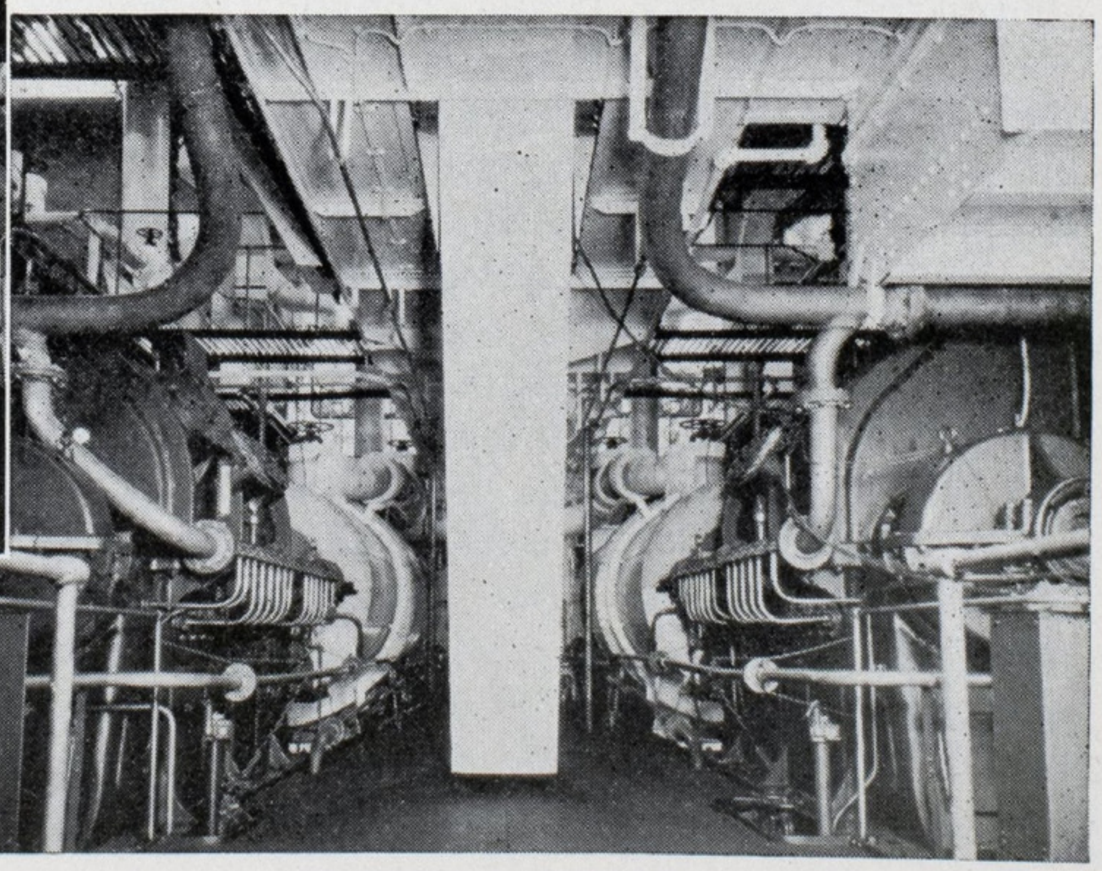


Above, High Pressure Evaporator

Below, Engine Room

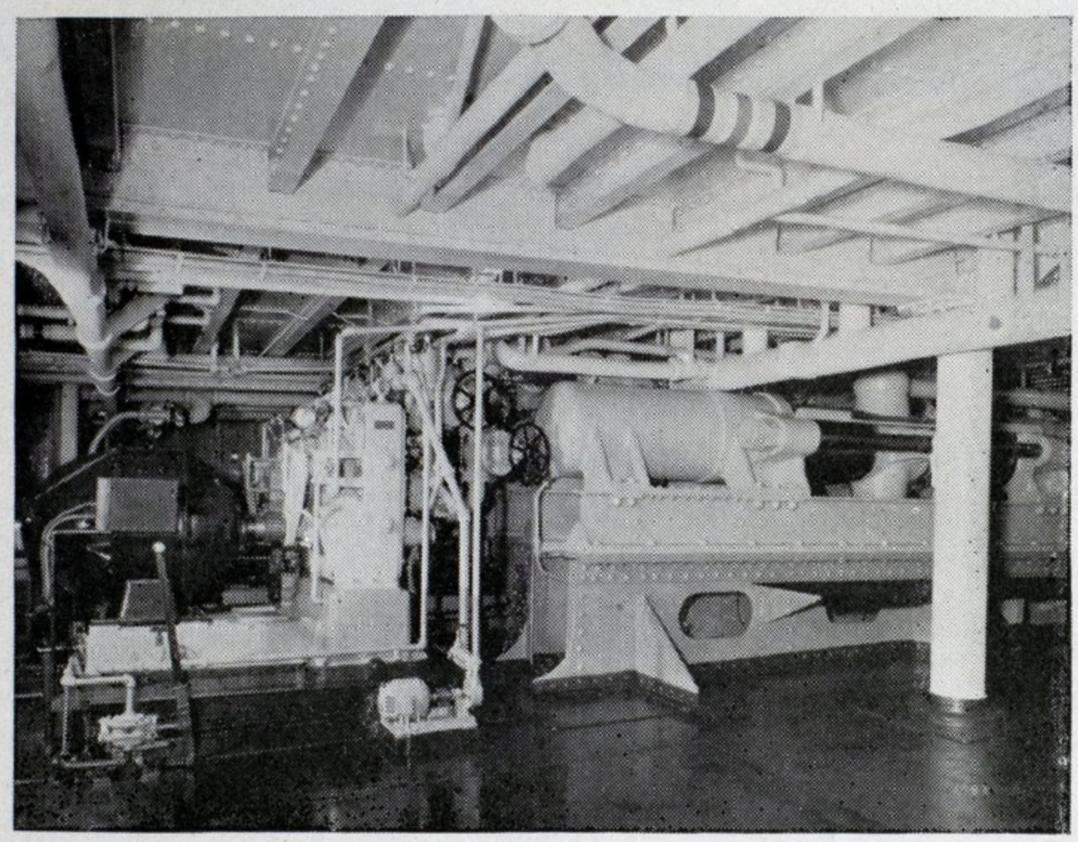


Above, One of the Six Boilers



priming type of 475 g.p.m. at 60 feet head and 15 feet suction were supplied by the Nash Engineering Co., South Norwalk, Conn.

The major part of the pumping equipment was supplied by the Worthington Pump & Machinery Corp., Harrison, N. J. Forty-nine pumps, all of this company's make, are installed listed as follows: Vertical simplex steam driven: one emergency fire and bilge, 10 x 12 x 24 inches; two emergency boiler feed, 12 x 6 x 18 inches; two emergency fuel oil service, 6½ x 3½ x 8 inches; two emergency make up feed, 3½ x 4 x 4 inches. Other steam pumps furnished



Main Steering Gear, Hydraulic-Electric Type

by this company are: Two vertical jet for high pressure evaporator feed and drain; two 20-inch turbine driven vertical centrifugal, for main condenser circulating; four turbine driven 3-inch vertical centrifugal for main condenser condensate and turbine drain; three turbine driven 2-inch vertical centrifugal for dynamo condenser condensate and turbine drain.

Another group of pumps, electric motor driven, of centrifugal type supplied by Worthington includes: Two 3-inch 2-stage fire pumps; one 2-stage deck wash pump; two 3-inch 2-stage, salt water sanitary pumps and two of the same kind and size for fresh water washing; two 2-inch, 2-stage, hot fresh water circulating and two of the same size for ice water circulating, also two of the same size for drinking water circulation; two 3-inch, 2-stage, for filling swimming pool; one 2-inch for swimming pool circulation; two 12-inch for dynamo condenser circulating; one 4-inch submersible self-priming emergency bilge; one 2-inch for makeup feed; two 3-inch brine pumps; one 2-inch, 2-stage for ship's refrigeration brine; two 4-inch refrigerator condenser circulating; two 2-inch air condenser water circulating; two 1½ inch air condenser brine circulating; and two 1-inch rotary pumps for lubricating oil service. All electric motors for driving pumps are of Westinghouse make.

Electrical Installation and Equipment

Electrical current is supplied by four Westinghouse turbine driven 3-wire generators, each of 500-kilowatt capacity. These generators furnish 240-volt direct current for all motor driven equipment. For lighting purposes the current is reduced.

In emergencies current can be supplied by a 75-kilowatt diesel engine driven generator. This will take care of emergency bilge pump, watertight doors and windlass and through the use of a compensator the emergency lighting of the vessel. As an additional standby to furnish immediate current there is an Exide ironclad storage battery of type M. V. A.-33 with a capacity of 200 amperes continuous for two hours. This battery was supplied by the Electric Storage Battery Co., Philadelphia.

Total Electrical Load is Heavy

IN the MANHATTAN there are 9179 lighting fixtures with a total of 8387 lamps, varying from 5 to 500 watts. Fixtures in passenger accommodations were designed and executed by the Sterling Bronze Co. Inc., New York in conjunction with the Ballard company, interior decorators. For illuminating the side of the ship when launching lifeboats, there are twenty-four 500-watt flood lights. In addition to the lighting load there is a total of 252 electric motors ranging from one-eighth to 115 horsepower aggregating 3564 horsepower.

A number of electric stations throughout the ship are fitted, wherever possible, with open type control equipment assembled on special panels for group control switchboard. All controls are semi-automatic with remote control pushbuttons at the motor. Another addition to the electric load are the more than 1200 marine type 12-inch oscillating fans in living quarters supplied by Diehl Mfg. Co., Elizabethport, N. J. The same company also supplied the large motor generator sets and a number of smaller motor generator sets for supplying power for the interior communication system.

Two elevators located at the main stairway forward are installed for the use of cabin class passengers. There is also one elevator in the engine hatch for the engineers and one elevator for carrying stores to the galley. All elevators were supplied by the Otis Elevator Co., New

York. The cabin elevators make six stops.

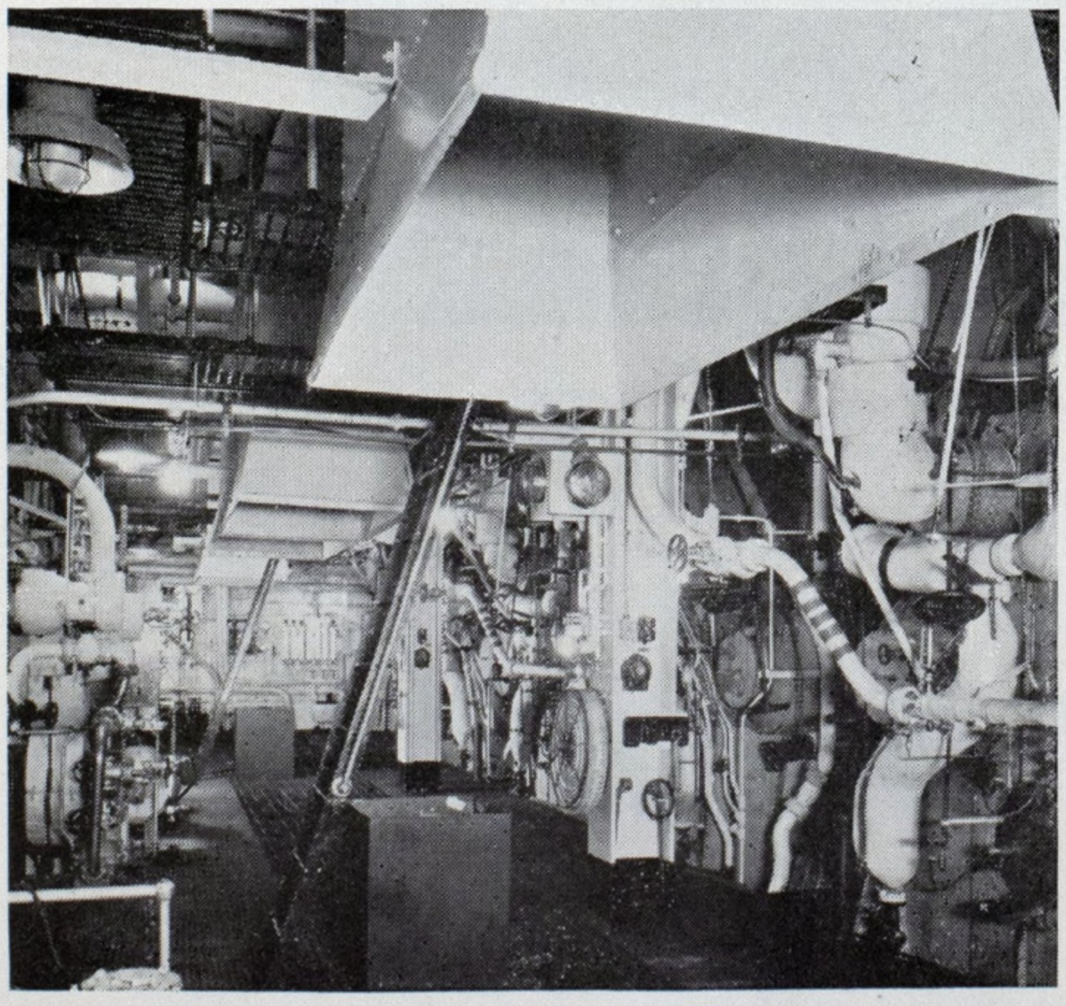
The domestic departments of the MANHATTAN are completely equipped and conveniently located. All kinds of labor saving machines have been installed to aid in preparing and serving over 5000 meals a day. The main galley, which serves both cabin and tourist, located between the respective dining rooms, is 80 feet wide by 105 feet long. Electrical cooking equipment is generally used.

Ventilation and Heating

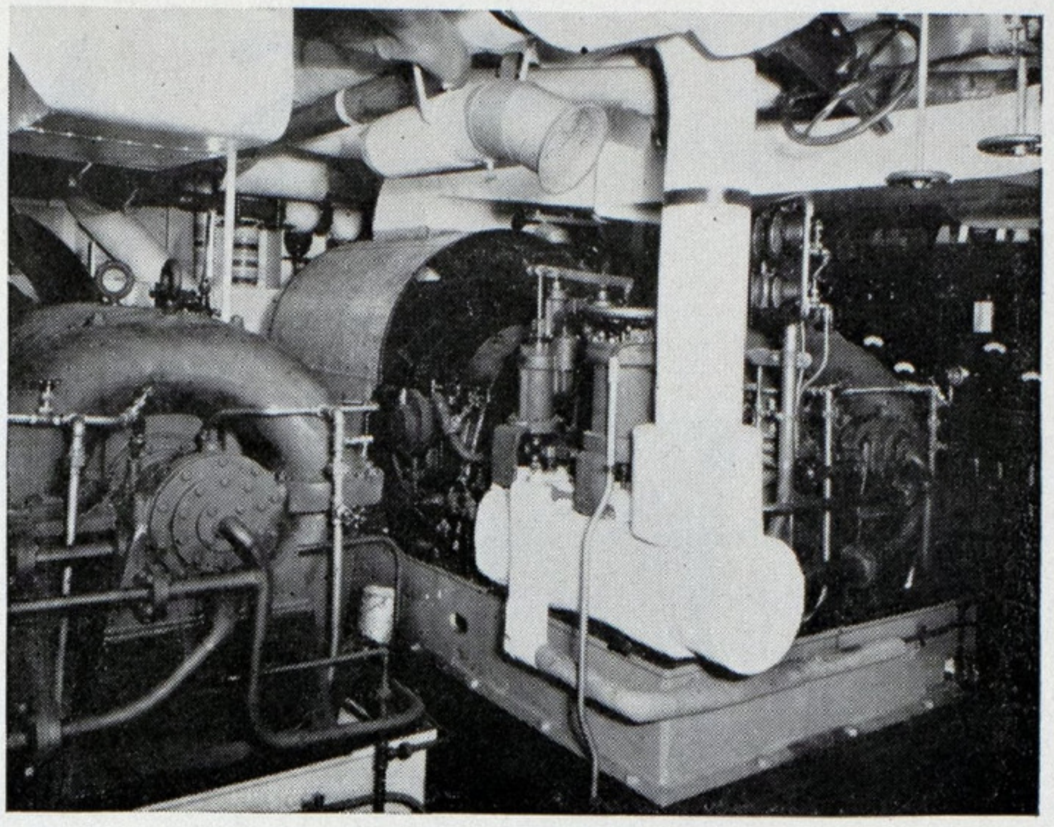
VENTILATION and heating are major problems on a large ship. For any degree of comfort mechanical systems must be installed. No less than 87 electrically driven fans supplied by B. F. Sturtevant Co., Boston, provide mechanical ventilation of living quarters and to the boiler and engine room spaces. To give silent operation the fans are mounted on special foundations and are operated at a low speed.

Air is distributed to all cabin, tourist and third class accommodations through punkah louvres which are adjustable for direction. By fin tube heaters attached to the fans the air can be maintained at a temperature of 70 degrees. When all the ventilating systems are operating at one time, excepting for the boiler rooms, a volume of 458,000 cubic feet of air is distributed throughout the ship.

For heating cabin staterooms, there are cabinet enclosed radiators supplied by the American Radiator Co., New York. All public rooms have a 2-pipe heating system at 45 pounds pressure. A similar system is fitted in the offi-



Number 2 Boiler Room Containing Three Watertube Boilers



Turbine Driven 500-kilowatt Electric Generators

cers and engineers quarters on the boat deck.

To avoid possible breakdown of the entire system, it is arranged in sections, any one of which may be cut out without affecting other parts of the vessel. Radiators fitted in the public rooms are of Murray brass finish type and are concealed by ornamental metal grilles. In the heating system 25,400 feet of extra heavy Toncan iron pipe and 900 feet of polished white metal pipe were used. The iron pipe was supplied by the Republic Steel Corp Youngstown,

Plumbing and Sanitary Systems

ELABORATE plumbing arrangements are provided for all living quarters. The Mott company of Pennsylvania supplied all the plumbing and sanitary equipment. Piping and plumbing fixtures in passenger and crew quarters, in all exposed locations, are of white metal. All lavatories and baths are supplied with hot and cold fresh water. Cold salt water is used for flushing all water closets and urinals and supplying all slop sinks. All galleys, pantries and mess rooms are supplied with drinking water.

Heaters of ample capacity, located in the auxiliary machinery room, supply the hot fresh water. Iced drinking water is circulated.

Some idea of the extent of the water service systems is indicated by the quantities of materials used as follows: 9200 feet of polished white metal pipe and, 54,800 feet of extra heavy Toncan iron galvanized pipe. The following material was used in installing the pumping drains; 1200 feet of polished white metal pipe, 14,300 feet of extra heavy Toncan iron galvanized pipe, 13,500 feet of lead pipe and 220 feet of copper pipe. In the vents from soil and drain lines 6400 feet of Toncan iron galvanized pipe was used.

T. S. S. MANHATTAN

Shipbuilding Yard, and Owner

IN BUILDING the MANHATTAN and sister ship WASHINGTON, the two largest and highest powered American-built merchant ships, the New York Shipbuilding Co. ably carries on the great shipbuilding tradition of the Delaware river district. For over 30 years at its yard at Camden, N. J., this company has maintained and increased its facilities to meet the constantly growing demands for more efficient and larger ships. Its reputation rests on a solid foundation of successful vessels turned out. No less than 58 of our own and foreign naval vessels, with a total displacement of 423,066 tons and with 1,783,740 indicated horsepower in propelling machinery, have been completed at this shipyard since 1900. In the same period 342 merchant vessels were built with an aggregate gross tonnage of 937,480 and machinery totaling 552,310 indicated horsepower.

In organizing the New York Shipbuilding Co. in 1899, the founders starting with a clean slate decided at the outset to carefully scrutinize old accepted tradition in shipbuilding practice and to discard all such practices not in keeping with the most modern methods. The name, New York Shipbuilding Co. came about because the original plan called for building the new shipyard in the New York district. As no suitable location could be secured in this district, a tract of about 160 acres of land on the east side of the Delaware, in the southern part of the city of Camden, N. J., across the river from Philadelphia, was selected after a thorough investigation of sites.

Five principles were laid down in the design of the new shipyard. With the exception of covered shipbuilding ways, the ideas advanced at that time have now been generally adopted. The first of these principles was the general application of templates in the fabrication of steel plates and shapes; second, covering the principal shops and building ways with a continuous roof structure for protection against the weather, not only in winter but in summer; third, installation of an overhead traveling crane system to effectively service every part of the yard, buildings and ways; fourth, routing material in an uninterrupted forward course from its receipt in the raw state to its assembly in finished shape on the ship; fifth, installation of propelling machinery and heavy weights before launching.

When the new war-time shipyards were laid down, the plan and methods of the New York Shipbuilding Co. became the model. That most stupendous shipbuilding enterprise in history, at Hog island, depended largely for its success on the available experience and skill of the staff of the New York Shipbuilding Co. The original set of templates from which the steel was fabricated for the cargo ships built at Hog island was produced by this staff.

At the present time the plant of the New York Shipbuilding Co. comprises 11 shipbuilding ways suitable for vessels of 700 to 900 feet in length. Five double ways ranging from 126 to 140 feet in width, a wet slip and the main shops are all under one continuous roof. Four overhead cranes of from 10 to 15 tons capacity serve each shipbuilding way and the wet slip. The entire group is also served by a 100-ton crane. Two open double ways, each 152 feet wide and capable of extension into two huge single ways for the construction of ships up to 1000 feet in length, adjoin the covered ways. Without craftsmen, however, the best equipment cannot produce good work and in this respect the yard is fortunate because in no other district will be found more competent workmen. It is the application of good workmanship that establishes a reputation for good ships.

Long Experience in Ship Operation

THE owner is experienced. The house flag on the MANHATTAN has had an important place in America's maritime history for nearly 40 years. In all that time it has always flown over some American ship. This house flag, with the blue spread eagle on a white ground, was designed for the famous American line in 1893. It has flown from such famous transatlantic liners as the ST. LOUIS and ST. PAUL, until the coming of the MANHATTAN, the last passenger liners built in American shipyards for the North Atlantic.

A notable group of American steamship executives from both the Atlantic and the Pacific is now the owner of the United States lines fleet. Among these are, P. A. S. Franklin, chairman of the board of the Roosevelt Steamship Co., Kermit Roosevelt, president of the Roosevelt Steamship Co., R. Stanley Dollar, president of the Dollar Steamship Co. and Kenneth D. Dawson, president, States Steamship Co.

« EDITORIAL »

Let us Build a Treaty Navy to Guarantee Peace

PUBLIC opinion would bitterly resent any pact or treaty giving up even the least significant of our rights as a free and independent nation. Any suggestion that we relinquish our position as a first class power is unthinkable. And yet, in effect, is this not precisely what we are doing in insisting on the one hand on our rights to a treaty navy and then on the other hand allowing these rights, so stoutly proclaimed in council, to be frittered away by our own inaction?

Let us have peace, and while disarmament is a move in the direction of peace it can never be effective if it is one sided. If all parties to the agreement, under the maximum limits set, refuse to build to these limits, well and good. But it has not worked out that way and until it does it is imperative that we keep pace with the others—or insist that they enter into a new arrangement lowering the limits to those we feel are sufficient for our needs.

In the meantime, since ships cannot be created on the eve of an emergency, precious days, months and years are passing and the vaunted parity agreed upon around the council table disappears. Shall we allow this condition to continue? That we are not keeping pace is an established fact. There are no reasons why we should not maintain parity and reason dictates that we must if we are to continue as a first class power.

In a vigorous endorsement of a recent resolution of the young men's board of trade of New York, expressing its belief in the expediency and urgent need of building up our navy to the limits set forth in the Washington and London naval treaties as outlined in the Hale and Vinson bills, Rear Admiral Henry A. Wiley, U. S. N. retired formerly commander-in-chief, United States fleet, said in part:

"I consider that the committee's report is well founded. It understates the facts and under emphasizes the nation's need for, and the maintenance of a treaty navy.

"I join with the committee and all sincere Americans in the ardent wish for lasting peace. I deplore, however, the means by which we hope or pretend to hope, to achieve it. Our efforts are through conferences and pacts and treaties and the destruction of armaments. After each conference that we enter and which results in agreements, we toss away a little more of our relative naval strength. We weaken ourselves relative to others, who, of course, at the same time gain by agreement. Coupled with this unwise course, we have been so parsimonious, short sighted and careless about our navy that we have not only not kept up to treaty strength, but many of our ships are now about to fall apart.

"We sit on our own doorsteps, fritter away our naval strength, listen to the so called idealists crying aloud that we must still have faith in pacts and reduce our navy, or we shall bring on another war. And when it is too late we shall wake up to the fact that we have sunk into a second class power.

"It is not too late to avoid this sell out. Our people should not permit it. All that is necessary is to direct an about face in our national policy. That change means militant leadership —devoted to American interests. Militant leadership means in the late President Roosevelt's words "To speak softly and carry a big stick." Reduced to simple language this means to treat all nations with consideration, to play the game of international intercourse as gentlemen carry on their own dealings, be prepared to defend ourselves (and the guts to do it) against any unwarranted infringement upon our rights.

"A treaty navy is the "big stick." It is our right to have it. It is our duty to have it. Any less naval strength is useless. The young men's board of trade of New York is right. I know, regardless of what others may say. The navy's mission is not to be able, in conjunction with the army to defend our continental limits against invasion. On the contrary, it is to uphold our national policies, to protect our commerce and to guard our continental and overseas possessions. Nothing less than a treaty navy is adequate. And what is inadequate—a navy of the type into which ours is rapidly sinking—is not only a useless burden, but a liability that may lead to disaster."

Complete Reconditioning Delmundo

Third of Four Rebuilt Ships for Delta Line

THE sailing of the newly reconditioned S. S. DELMUNDO on Aug. 13, to be followed shortly thereafter by her sister-ship DELVALLE will mark the formal completion of the program of conversion and improvements of the fleet of the Mississippi Shipping Co., New Orleans. The original plans of the company provided for the reconditioning of four Hog Island type freighters, stepping up their speed from 10 to 13 knots, and installing accommodations for 25 passengers each. The DELNORTE and her sister-ship DELSUD, which were placed in service in the summer of 1931, with accommodations for 28 passengers, have proven so popular that when drawing plans for the DELMUNDO and DELVALLE it was decided to increase the number of passenger berths to 38. The four ships will enable the company to maintain regular express freight and passenger service between United States Gulf ports and the principal East coast of South America ports with sailings at regular intervals of not more than three weeks.

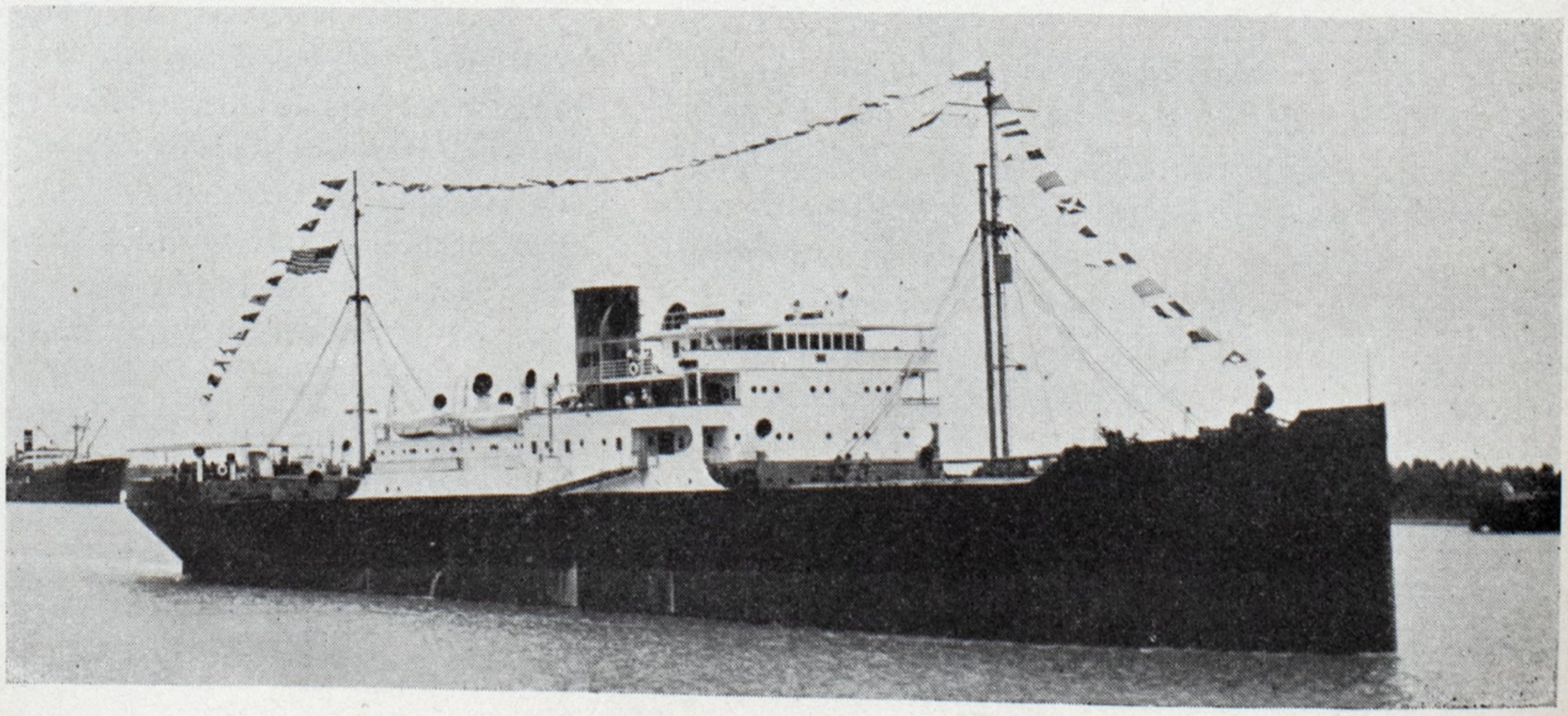
The DELMUNDO and DELVALLE were converted and reconditioned by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., in accordance with plans and specifications developed by V. M. Friede, naval architect, New Orleans, and under his supervision. He was assisted in the preparation of the machinery specifications by C. W. McKenzie, port engineer of the Mississippi Shipping Co. Mr. McKenzie also served as supervising engineer and resident inspector in charge of the execution of the plans.

Plans Embody Operating Experience

In drawing the plans and specifications the needs and requirements of the trade, as outlined by N. O. Pedrick, general manager of the company, were closely followed and in addition the plans and specifications were made to comply with the rules and recommendations of the American Bureau of Shipping, United States steamboat inspection service and the United States public health service. The United States navy department also approved the plans. Several major changes to the vessels were necessary in order to comply with the rules of the international convention for the safety of life at sea and although the United States has not yet formally ratified this convention the company deemed it advisable to comply with the convention's requirements. One of the principal changes in this connection was the building of a new watertight bulkhead subdividing No. 1 hold into two separate and independent compartments, thus affording a high safety factor.

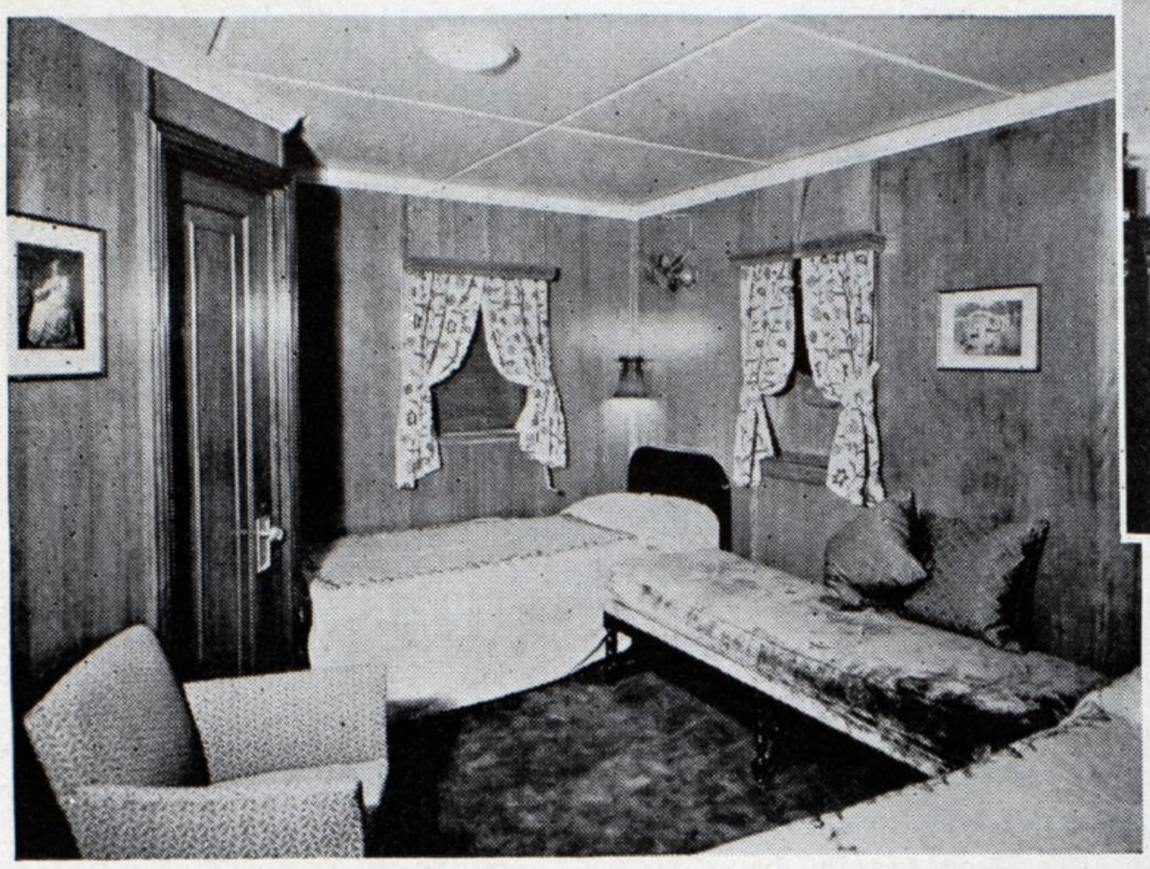
In order to attain the desired speed of 13 knots, considerable changes were made in the machinery of the ships. The turbine rotor and reduction gears were completely rebuilt by the manufacturer, the General Electric Co., and that company's latest type of reduction gearing was installed. The old condenser was removed entirely and a new Ingersoll-Rand condenser of patented design and of considerably larger capacity was installed. Air ejectors, new circulating pump, new condensate pump, new injection and discharge valves and various other condenser auxiliaries of the latest design were installed in order to insure maximum effiiciency of the propulsion equipment.

The three Babcock & Wilcox boilers were thoroughly overhauled and the boiller pressure was increased to 207 pounds per square inch as allowed by the United States steamboat inspection service. To further increase the effi-



DELMUNDO, Hog Island type freighter, third of four vessels reconditioned for the Mississippi Shipping Co. Speed increased to 13 knots. Accommodations for 38 passengers Above, dining room on the Delmundo

BELOW, typical stateroom on the Delmundo. The elaborate reconditioning of the Delmundo and sister ship Delvalle has been carried out by the Newport News Shipbuilding and Dry Dock Company. With their sister ships Delnorte and Delsud, they will provide regular service between New Orleans and East Coast South America



ABOVE, comfortable and attractive lounge on the Delmundo. The sister ships Delnorte and Delsud placed in service last summer proved so popular in service that passenger accommodations on the Delmundo and Delvalle have been increased from 25 to 38 on each vessel

ciency of the boilers there were installed Diamond soot blowers, Babcock & Wilcox feed water regulators, Rowe & Davis feed water heaters and Warren feed pumps of larger capacity and the old pumps were removed. Several other auxiliary pumps, such as sanitary salt water, fresh water pumps, etc., were installed and the entire equipment of the engine and boiler rooms was overhauled and placed in first class working condition.

Further in connection with the increase of speed, the entire bottom of the vessel was scaled to bare metal, the bilge keels were shortened and the sight edges of the shell plates were streamlined by cementing and a new four-bladed bronze propeller of appropriate pitch was installed. The after end of the hull was streamlined and a new Contra rudder designed by The Goldschmidt Corp. was installed in place of the old balanced rudder.

The passenger accommodations throughout were designed to give the passengers comfortable, artistic and restful surroundings. There are 15 staterooms, all outside rooms. Six of the staterooms are provided with private bath and toilet, there being hot and cold fresh water showers in all bath rooms. All staterooms have hot and cold running fresh water and in addition to this there are provided four public baths.

As the vessels will operate a large part of the time in tropical waters, particular attention was paid by the designer to ventilation and other means of providing comfort during hot weather. High ceilings in staterooms and public spaces and ample promenade deck area are further aids to the comfort of the passengers. Special attention was paid to insulation and in order to reduce radiation from bulkheads exposed to sun rays all the outside bulkheads in way of the staterooms were insulated with Sisal Kraft Tuca Flexfelt in blankets 2 inches thick. The boiler room bulkhead was also well insulated in order to prevent radiation into living quarters..

Attractive Public Spaces

The interior finish is principally panelling with the exception of the lounge which is finished in Morene laid on masonite. Stateroom panelling is finished in natural birch; that in the foyer, dining room and alleyways in rich walnut. The smoking room is finished in aged oak rough surfaced and with a gray tint in the open beams capped with dark aged oak in dining room, foyer and lounge. The stairway leading from foyer on bridge deck to the lounge on boat deck is carried out in keeping with the period design, being gracefully curved and finished in dark walnut with decorative newels and balusters.

The period chosen as the motif for the interiors was the Tudor and this has been carried throughout the accommodations. All alleyway and dining room entrances have Todar arches and the foyer is blended gracefully into the dining room. The dining room is particaulrly attractive and is well ventilated by six double windows extending up through the well over the dining room and opening onto the maximum light and air circulation. Passengers are seated at eight tables accommodating two, four, or six persons. Comfortable and richly finished dining room chairs together with artistic and efficient lighting add the finishing touches to the dining room.

The lounge is also worthy of special mention and no effort has been spared to make this the most popular and comfortable room on the vessel. Deep chairs and sofas, occasional tables, writing desks and specially designed table and bridge lamps carry out the period design. The finishing touch is provided by antique period mirrors flanking a beautiful oil painting, a copy of the well known portrait of Sarah Siddons by Sir Joshua Reynolds.

The furniture, lamps, draperies and curtains were selected by Elizabeth Capers, interior decorator, New Orleans. The staterooms are furnished with beds manufactured especially for the vessels by the Crescent Bed Co., New Orleans and are fitted with Simmons "beauty rest" mattresses. Boudoir chairs and patented dresser and wardrobe units with dressing table lights complete the stateroom furnishings. For comfort in the staterooms exceptionally large air ports are provided and those rooms having openings to the side of the ship are fitted with large sliding windows manufactured by the American Locomotive Co. All window and air port openings are fitted with brass mosquito screens.

Ample Promenade Space

The principal promenade deck space is on the boat deck outboard of the lounge. Additional promenade deck space is provided on top of the lounge and also on the landing platform on each side of the ship through which one enters into the foyer. These landing platforms are large and commodious.

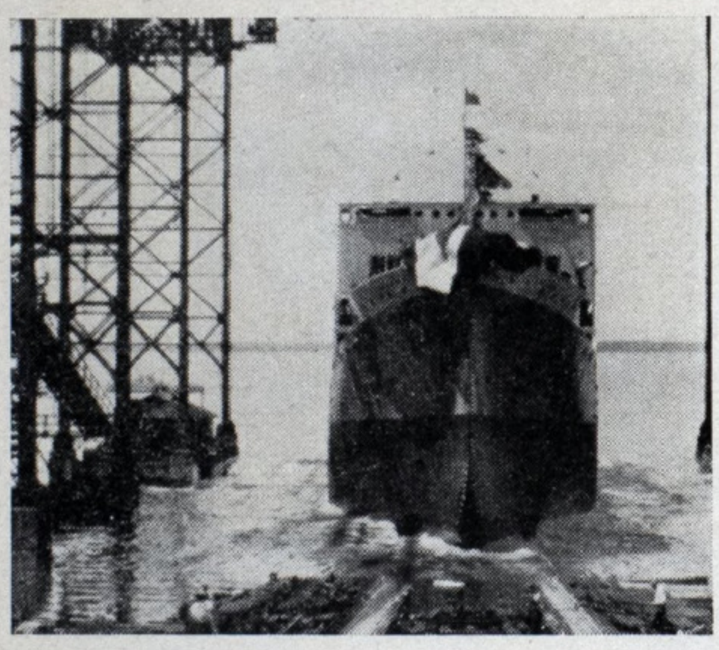
A new pilot house has been constructed on the navigating bridge deck and the deck officers including the wireless operators are housed in

(*Continued on Page* 48)

S. S. Colombia, Launched at Newport News

THE COLOMBIA, first of two large combination freight and passenger ships being built by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for the Colombian Mail Steamship Corp., New York, was launched at 11:15 a.m. on Aug. 6, Mrs. C. H. C. Pearsall, wife of the vice president and general manager of the Line was sponsor. She was attended by her two daughters as maids of honor, the Misses Olive Ann and Kathleen. A large party of dignitaries from both this country and the Republic of Colombia, and persons prominent in shipping circles of the United States and Canada attended the launching as guests of the shipbuilding firm, and were entertained afterwards at a delightful luncheon at the new James River Country club.

Of unusual interest at the launching ceremonies was the presentation to the sponsor of a flag of the Colombian Re-



Single Screw, Passenger and Freight Steamship Colombia Launched Aug. 6

public by Senor Rabio Lozano, minister of Colombia at Washington, in token of the friendship existing between his country and the United States.

Designed by Theodore E. Ferris, well known New York naval architect and marine engineer, the new vessel has an overall length of 404 feet 5 inches, beam of 57 feet 5 inches, a depth of 31 feet 6 inches, a draft of 23 feet 6 inches, and a gross tonnage of approximately 5400. She is of the single screw, three deck type with long bridge erections, forecastle and poop, with an elliptical stern and a straight stem with a slight forward valve.

The propelling machinery consists of one set of Newport News impulse type turbines, comprising one high pressure, one intermediate pressure and one low pressure turbine in series, each driving a separate pinion of a single reduction gear. Astern elements of the impulse type in series are incorporated in the exhaust end of the intermediate and low pressure turbines. The machinery is rated at 6500 shaft horsepower and is capable of delivering 15 per cent overload. The guarantee speed is 16 knots. Four oil burning Babcock & Wilcox water-tube boilers are fittted supplying steam at 400 pounds per square inch pressure with 230 degrees superheat. Practically all of the auxiliary machinery is electrically driven.

The COLOMBIA, will be used in the expansion of the owners South and Central American route, and will mark entry into the passenger carrying trade on a much larger scale, as heretofore freight services have been maintained almost exclusively. A large part of the business is the carrying of tropical fruit. Luxurious accommodations are provided for 120 first and 24 tourist class passengers, all in large well ventilated outside rooms.

The cost of constructing the COLOMBIA and her sister ship the HAITI, will be approximately $5,000,000. The vessel will make her maiden trip from New York in November, according to present plans.

European Shipowners Face Difficult Problems

More and more British shipowners are keeping their labor employed by going in for scrapping contracts, generally by agreement with one of the big steel firms, but even that is scarcely worth while with the breaking up price of tonnage steadily dropping. Recent sales to scrappers, both British and Italian, have been at a ridiculous price, sometimes under 7 shillings per gross ton and even then frequently with a good deal of bunker coal included.

The only two really noteworthy ships that have been completed during the quarter are the White Star GEORGIC and the Compagnie Generale Transatlantique CHAMPLAIN, which are both designed for the Western ocean cabin service and which are certain to be keen rivals on the New York run. Except for her machinery the CHAMPLAIN is much like the LAFAYETTE and the GEORGIC, described elsewhere in August, is practically a sister to the BRITANNIC, both of them successful vessels. The much discussed French line flyer, in which the turbo-electric drive has been taken to far greater length than in any other ship, is scheduled to be launched at the end of October and is to be christened PRESIDENT DOUMER.

European shipping has many problems before it at the moment, but as far as the Western ocean trade is concerned one that calls for immediate attention is the question of the cabin liner. When the phrase was first applied it was either to a declassed first class ship or else a vessel of moderate size and speed which carried passengers at something like second class rates. Ships like the GEORGIC, CHAMPLAIN, or the Canadian Pacific DUCHESSES are magnificent vessels in every sence of the word and there are owners who maintain that they ought to be tallied as first class, although of course their fares would be adjusted in comparison with the channel route giants. The owners of these successful ships naturally oppose this idea and maintain that they ought to reap the full benefit of their enterprice.

Two-Ply Stainless Steel

A successful two-ply and stainless steel has recently been developed by the Ingersoll Steel & Disc Co., Chicago, a division of the Borg Warner Corp. This new metal has been named Ingoclad stainless steel and is produced by a patented process from the composite ingot.

In ship construction where resistance to corrosion, strength and a pleasing finish are necessary this new metal should find many applications. It may be deep drawn, stamped, welded, formed and polished and it will be sold at a price that will permit its use in many instances where solid stainless steel would be prohibitive in cost.

Years of research have preceded the development of the perfected manufacturing process of uniting the stainless steel surface and the carbon steel back in a faultless bond.

Production is under way at the company's New Castle, Ind. plant and it is now available in various gages and sizes of sheets. All practical commercial sizes will be manufactured.

An order amounting to more than $100,000 has been received by the Westinghouse Electric & Mfg. Co. from the United States navy department for aircraft radio transmitting and receiving equipment.

Error is Corrected

In the July issue of MARINE REVIEW in connection with the article by Mr. Powers on Painting in Protecting Ships' Bottoms, attention has been called to an error in the painting specifications of the army dredge SAN PABLO. The paint was not *applied* by the United States. It was *supplied* by the government and it was the contractor's job to apply it.

Retirement of Capt. Nelson in Ninth District

IN THE retirement of Capt. Nils Bernard Nelson as supervising inspector of the ninth district, with headquarters at Cleveland the steamboat inspection service loses one of its ablest and most conscientious representatives. His career spans the entire period of the evolution, in the modern era, from sail to steam. He was appointed supervising inspector Jan. 10, 1912.

His retirement at the usual age was deferred by three successive extensions due to the reluctance of his superiors to dispense with his experience and ability in handling the affairs of his office.

As a member of the board of supervising inspectors Capt. Nelson contributed much to the advancement of the safety of life and property at sea by helping to formulate the rules and regulations of the service. He attended the international conference for safety of life at sea at London in 1929 as a technical adviser to the American delegation. His counsel was often sought by vessel owners and by officers and men of the vessels and was always fairly and freely given.

He was born in Sweden, Jan. 5, 1856 and his forbears were seafaring people. His father was lost at sea while master of a sailing vessel. His only brother was lost overboard from a sailing vessel of which he was second mate. From the time he was eight until he was eighteen years old he spent his summers on vessels plying the North sea and the Baltic. At the age of thirteen he made a voyage to Archangel on the White sea.

In 1875 he arrived at Quebec on a Norwegian ship and shortly after began his career on the Great Lakes as a seaman, finally becoming chief officer. During this period at times in winter months he sailed on the Atlantic coast. In 1880 he received his license as master and in 1885 he received his first command of sailing vessels. In 1896 he brought out the steamer ROBERT FULTON one of the first 400-foot ships on the Great Lakes.

He continued in command of Great Lakes vessels and was master of the L. W. NICHOLAS when he was appointed local inspector in the steamboat inspection service at Cleveland, July 6, 1905.

Labor Day Lifeboat Race

The first American entry for the sixth annual international lifeboat race for the William H. Todd silver trophy, to be held on Labor Day, has been received from the MANHATTAN, of the United States Lines. The race will be held over a 2-mile course off Bay Ridge, Brooklyn. N. Y. Capt. George Fried, rescue hero of the North Atlantic, commander of the MANHATTAN, intimated his intention to compete before the ship sailed from New York on Aug. 11. The MANHATTAN is due back in New York on Sept. 1 from her maiden voyage.

Seven other entries have thus far been received, representing boats from Norwegian, German, Italian, Dutch and British ships.

The race is run under the auspices of the Neptune association, of which Capt. John F. Milliken is secretary-treasurer. Gold, silver and bronze medals, presented by the Neptune association, will be awarded the winners and placed entries.

Given Charge of Bethlehem West Coast Plants

IT WAS announced on Aug. 18, by E. G. Grace, president of Bethlehem Shipbuilding Corp., Ltd., that S. W. Wakeman, vice president in charge on the East coast, has also been placed in charge of the West coast activities of the corporation, succeeding in the latter responsibilities J. J. Tynan, who is retiring as a vice president of the corporation after many years of service.

Mr. Tynan will retain his connection with the Bethlehem organization, in an advisory and consulting capacity, as a vice president of Bethlehem Steel Co., with headquarters in San Francisco.

A. S. Gunn will continue as general manager of West coast shipbuilding and ship repair plants, reporting to Mr. Wakeman.

Opens Washington Office

L. R. SANFORD, for a number of years technical expert in the bureau of law of the United States shipping board, has opened an office as consulting naval architect and marine engineer, 615 Mills Building, Washington, D. C.

Due to his years of experience both in ship construction and in legal cases involving the construction and performance of ships he is especially well qualified to represent, shipping and shipbuilding interests in matters based on technical considerations such as surveys, appraisals investigations and to give opinions and expert testimony in legal cases involving ship construction, repairs and operation.

Mr. Sanford is a graduate of the University of Michigan in marine engineering. He is a member of the Society of Naval Architects and Marine Engineers and several other technical societies and is licensed by the United States department of commerce as a marine engineer and by the state of New York to practice as a professional engineer.

Elected President, Diesel Engine Association

ON AUG. 6, the Diesel Engine Manufacturers' association announced that at a recent meeting, H. Birchard Taylor of Philadelphia was elected president, succeeding George W. Codrington of the Winton Engine Co. of Cleveland, who was elected chairman of the board. E. T. Fishwick of the Worthington Pump and Machinery Corp. continues as chairman of the executive committee. Mr. Taylor proposes to devote a considerable proportion of his time to the active management of this association.

The Diesel Engine Manufacturers' association was organized in 1928 and has since been active in promoting trade standards in the diesel industry and in gathering diesel engine statistics. The association maintains an office at 30 Church street, New York

H. Birchard Taylor

Mr. Taylor, was graduated from the University of Pennsylvania in 1905 and at that time entered the drafting room of the hydraulic department of the I. P. Morris Co., Philadelphia. In 1911 he was made hydraulic engineer.

In 1915 he was appointed assistant to the president of the William Cramp and Sons Ship & Engine Building Co. and was elected vice president in 1917, an office which he held until 1927 when Cramps discontinued shipbuilding. At that time he was elected president of Cramp-Morris Industrials, Inc.

During his career Mr. Taylor has been president of the De La Vergne Machine Co., the Federal Steel Foundry Co., the Atlantic Coast Shipbuilders' association, vice president and member of council of the American Society of Mechanical Engineers. He is now president of the general alumni society of the University of Pennsylvania and consulting engineer to the Baldwin Locomotive Works.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

IN THE case of Sun Oil Co. v. Dalzell Towing Co., 55 F. (2d) 63, it appeared that the towage contract involved was oral, "as is usual in towage cases, consisted merely of an order telephoned by the tow owner and accepted by the tug owner." In view of this, the court held that the full terms of the contract must be spelled out by the court from the previous dealings of the parties. It was further declared that a provision that the tow owner should be chargeable with damage resulting from handling of the vessel by the tug master furnished as pilot was valid.

* * *

A VESSEL is not bound to prove that her fault could not have contributed to a collision between other boats, when she herself collides with neither.—NANUET, 55 F. (2d) 222.

* * *

ONE who purchased a steamship ticket from New York to Havre, France, and a separate ticket from Havre to Paris, cannot, it was declared in the case of Wiener v. Compagnie Generale Transatlantique, 55 F. (2d) 252, recover from the steamship carrier for his trunk lost on the railway between Havre and Paris, though he received from the steamship company at New York a trunk check reading from New York to Paris.

* * *

A LIBELANT who had paid 75 per cent of the purchase price of an entire cargo upon indorsement to it of the bill of lading and other documents, had incurred expense of transporting the cargo from the ship, and was both the charterer of the barge and the consignee of its cargo, will not be restricted to nominal damages, but will be permitted a full recovery for breach of warranty, on sinking of the barge and loss of cargo.—FRED E. HASLER, 55 F. (2d) 389.

* * *

WHERE the duty lies upon a steamer to keep out of the way, the duty of a sailing vessel is to hold her course—New England Maritime Co. v. United States, 55 F. (2d) 674.

* * *

SALVAGE must not of course be made merely an opportunity for officious interlopers; a vessel in distress is not to be killed by kindness, particularly that of interested friends," said the court in the case of WILLIAM ROCKEFELLER, 55 F. (2d) 904. "And yet it is hard to say," the court continued, "when an oil ship is on fire, she will not profit by a deluge of water from many nozzles. At least she can turn away those which she does not want, and if she allows them to do what they can, she is scarcely in position to complain of their services."

* * *

IN THE case of FRED E. HASSLER, 55 F. (2d) 919, it was said: "The contract of affreightment carried an implied covenant of seaworthiness which has at least a double aspect, namely, that the vessel shall be fit to receive cargo when loading begins, and shall be fit to sail at the time of sailing. * * * Insecure ports or hatches which are believed to be secured so that nothing more is expected to be done about them, will render a vessel unseaworthy, although if their condition were known and inadvertently allowed to continue, the resulting damage would be caused by negligence of the crew, not by unseaworthiness of the ship."

* * *

WHERE the courses, though not the headings, of vessels were head and head, or nearly so, rule IV of the Inland rules applies, and made it the duty of each vessel to pass on the port side of the other.—Chester A. Poling, Inc., v. United States, 55 F. (2d) 921.

* * *

IF THE owner of a vessel allows another to have complete control of the vessel for an indeterminate time so that the latter may employ her in his own enterprises, the transaction amounts to a demise charter, terminable at will, and renders such other person, as owner pro hac vice, the only one personally liable for obligations which he contracted.—JOHN E. BERWIND, 56 F. (2d) 13.

* * *

THE fishing craft, NEW MOON and URANIA, collided while fishing on the fishing grounds off Cape Flattery. In determining the fault for the collision, the district court of the United States had this to say: "The origin of admiralty regulation of navigation and commerce was the power of the admiral. Anciently, he was a great officer, governed the navy and adjudicated all maritime matters, and his power in navigation and commerce extended over the navigable waters to all parts of the world. The origin is in doubt, probably Asiatic, unknown in Europe before the time of the Holy wars. The admiral judged all matters relative to merchants and mariners pursuant to law of Oleron, which was taken, so far as it was available, from the Rhodian law, which was promulgated about 70 years after the reign of Solomon, King of the Jews. The autocratic power of the admiral by long period of melioration and unfolding through development of common rules of principles and usage which grew out of conduct and habits of those engaged in maritime commerce, found expression in the equitable system of admiralty law now in force among the nations. * * * The written rule, no doubt, first found expression after the need was established by rules and principles, usages, developed by the conduct and habits of those engaged in traffic on the sea, suited to people in definite localities and special institutions. Our admiralty rules and law are dependent on laws of the United States. * * * The admiralty extends to the high seas, and also to navigable rivers, whether tidal or not, and to rivers and lakes which are highways of commerce, not to a river not of itself a highway for interstate or foreign commerce. The waters in this zone (off Cape Flattery) were not used by the fishermen for interstate or foreign commerce. Navigation or commerce, or acts having relation thereto, are essential ingredients of application of navigation rules. While the waters within the fishing zone of Cape Flattery are tidal and navigable, the fishing boats and fishermen are not engaged in commercial navigation, as such, or commerce." The court then held that, in view of usage and rules, it appearing that the NEW MOON set its net and cast its seine by forward movement and then, giving a signal by whistle blasts, proceeded to port to circle the fish, and proceeded to port on its course at the usual speed, the collision resulting when the URANIA proceeded across the course of the NEW MOON was due solely to the URANIA'S fault.—55 F. (2d) 928.

* * *

TUG which goes to sea in face of storm signals does so at its own risk, but it may be exonerated by the event. CHEHAW, 54 F. (2d) 645.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	238	1,483,476	254	1,553,215
June	267	1,579,970	277	1,650,915
May	277	1,484,116	259	1,392,451
April	270	1,506,696	277	1,515,147
March	332	1,982,670	375	2,070,546
February,	312	1.875,981	322	1.776,394
January	**297**	**1,821,335**	**305**	**1,719,978**
December	314	1,692,258	343	1,744,190
November	304	1.564.284	308	1,542,849
October, 1931	309	1,626,094	322	1,708,560

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	49	130,439	38	85,956
June	55	157,399	36	102,354
May	66	205,184	46	142,889
April	55	165,646	51	159,427
March	57	186,479	45	151,190
February	49	150,899	34	98,667
January	**51**	**168,266**	**36**	**114,982**
December	58	180,172	42	132,734
November	52	148.335	37	111,969
October, 1931	69	192,159	57	160,609

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	121	408,896	101	346,926
June	116	342.057	95	322,558
May	125	294,093	97	257,608
April	103	308,951	72	215,237
March	99	319,863	65	217,992
February	107	315.036	63	213,166
January	**94**	**286,508**	**61**	**208,491**
December	102	313,977	65	240,908
November	75	241,142	52	166,786
October, 1931	98	325,261	66	241,072

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	9	15,156	10	17,733
June	10	25,895	11	26,519
May	14	26,484	14	29,669
April	10	22,911	10	24,483
March	14	41,083	13	35,993
February	20	53,793	20	56,558
January	**13**	**28,179**	**14**	**28,955**
December	18	38,860	18	37,319
November	17	40.991	19	47,514
October, 1931	17	39,060	26	34,195

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	2	5,918	2	9,634
June	7	22,359	3	7,151
May	7	24,204	....	.....
April	4	17,438	3	13,515
March	8	35,293	5	24,289
February	5	19,442	4	18,533
January	**8**	**41,147**	**4**	**21,654**
December	11	41,268	4	17.037
November	9	35,826	5	18,040
October, 1931	6	22,833	6	23,836

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	21	84,961	24	99,035
June	20	80,272	25	98,356
May	20	82,750	25	99,862
April	23	83,171	28	104,796
March	26	103,924	36	142,050
February	32	127.810	36	149,417
January	**27**	**112,542**	**42**	**168,762**
December	29	114,184	40	154,060
November	26	103,835	47	182.585
October, 1931	36	144,875	54	207,518

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	88	255,354	86	255,209
June	95	299,502	97	294,264
May	95	289,042	102	317,751
April	108	346,276	114	377,317
March	96	288,052	105	319,511
February	105	337,487	98	323,603
January	**95**	**301,958**	**102**	**328,876**
December	102	330,709	106	354,320
November	99	304,138	98	314,109
October, 1931	116	388,308	111	385,136

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
June, 1932	18	51,803	48	114,222
May	24	52,049	43	112,672
April	22	59,932	33	77,515
March	33	79,948	42	99,939
February	22	68,136	48	121,647
January	17	53,536	38	104,392
December	30	95,762	38	110,614
November	23	77,075	47	113,416
October	25	76,385	54	146,995
September, 1931	24	72,333	47	104,255

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	8	20,558	7	16,963
June	7	12.746	10	20.277
May	12	33,157	8	20,489
April	9	17,886	9	21,812
March	8	15,560	13	26,457
February	8	18,785	10	21,812
January	8	26,601	12	27,759
December	12	25,453	10	21,501
November	6	14.295	8	22,180
October, 1931	10	25,659	9	17,710

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	38	62,503	40	62,486
June	37	61,115	39	76,274
May	56	76,236	55	76,070
April	55	77,443	50	80,778
March	41	61,078	39	59,069
February	39	59.334	39	66.392
January	43	67,913	42	71,873
December	39	68,392	40	73,365
November	40	53,752	42	53,497
October, 1931	37	57,588	37	59,408

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	107	222,810	99	203,444
June	91	207,178	93	201,443
May	102	212,215	97	198,871
April	102	192,617	104	202,965
March	97	204,645	98	211,921
February	101	235,846	96	219,215
January	**110**	**253,792**	**112**	**242,378**
December	98	226,656	85	214,395
November	100	214.204	87	189,474
October, 1931	118	251,661	112	253,721

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	32	145,560	36	162,923
June	36	160,585	32	143,574
May	43	184,393	41	170,652
April	40	171,346	43	191,352
March	43	190,082	43	180,862
February	50	217,837	54	232,138
January	48	200,281	50	216,819
December	50	218,018	48	204,111
November	48	209.655	50	215,614
October, 1931	61	257,329	62	267,366

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	166	438,496	171	448,198
June	170	597,552	164	457,960
May	182	517,523	169	472,154
April	192	558,631	194	559,824
March	200	604,269	196	589,805
February	157	436,882	169	469,296
January	171	516,707	171	506,411
December	169	482,802	170	504.981
November	173	498,800	169	483,099
October, 1931	174	502,867	195	563,095

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net. tonnage	—Clearances— No. ships	Net tonnage
July, 1932	17	39,628	14	39,844
June	26	80,438	25	78,864
May	29	80,415	27	71,288
April	21	53,404	21	57,341
March	37	131,723	36	110,353
February	32	88.616	27	75.262
January	24	73,488	22	16,217
December	37	108,083	35	96,490
November	19	31.125	11	35,588
October, 1931	20	49,738	22	55,371

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	27	50,302	79	220,489
June	28	47.046	81	226,542
May	38	84,468	86	259,026
April	44	91,609	106	297,262
March	32	61,079	109	319,013
February	27	64.866	101	317.095
January	26	73,215	92	292,274
December	37	113,327	111	358,950
November	33	81,906	101	328,883
October, 1931	35	80,748	112	354,607

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	226	646,417	230	617,947
June	168	588,184	162	558,945
May	229	691,109	164	650,539
April	189	617,325	222	635,301
March	168	622,067	188	611,770
February	164	627.876	158	622,730
January	144	578,699	149	594,384
December	153	517,165	136	506,985
November	147	503,238	142	535,870
October, 1931	215	720,162	193	678,776

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	148	687,695	142	655,436
June	133	588.465	132	590,158
May	154	669,735	152	649,509
April	146	663,647	144	613,085
March	139	645,331	162	709,778
February	149	638,222	144	583,030
January	145	635,218	147	646,987
December	155	649,915	122	579,608
November	167	688,934	149	614,482
October, 1931	167	688,934	149	614,482

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
July, 1932	17	66,968	20	87,589
June	20	93,807	31	119,752
May	29	122,192	36	149,039
April	31	131,585	39	155,861
March	27	113,624	43	167,956
February	25	103,589	43	162,236
January	25	108,322	36	145,084
December	26	99,354	42	148,568
November	34	139.899	62	225,833
October, 1931	28	126,071	52	194,114

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 57 of 190,776 net tons entered and 58 of 198,122 net tons cleared for the month of July.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

SUCCESSFUL sea trials of the new United Fruit liner VERAGUA, fifth vessel to be completed in the company's big shipbuilding program of six sister ships, were held July 28. She left the Fore River yard of the Bethlehem Shipbuilding Corp., Quincy, Mass. at 8:00 a.m. and returned in the evening of the same day. Officials on board, representing the owner, expressed themselves as entirely satisfied with the vessel's performance. She readily attained a speed in excess of her contract requirements of 17½ knots. The trials were held off the New England coast. During the trials the VERAGUA was run at various speeds forward and astern and was put through every maneuver as she may be called upon to meet in actual service.

Delivery of the vessel to representatives of the owner took place at the Fore River plant, Quincy, Mass., on Aug. 5. She arrived in New York on Aug. 6, and sailed on her maiden voyage from New York, Aug. 11, for Havana, Kingston, Cristobal and Port Limon with a big list of passengers. She is in command of Capt. Clarence Whidden, widely known American ship master.

The VERAGUA, like her sister ships, has an overall length of 447 feet, 10 inches a beam of 60 feet and is of 11,000 tons displacement. Her turbine electric propulsion machinery develops 10,500 horsepower at a speed of 17½ knots. Luxurious accommodations are provided for more than 100 passengers in outside staterooms, many of which have private baths.

Other vessels in the United Fruit Co.'s new shipbuilding program are the ANTIGUA, CHIRIQUI, TALAMANCA, QUIRIGUA and PETEN. The first three, recently entered the company's new fast service between San Francisco and the West coast of Central America. The QUIRIGUA was recently placed in the New York-Costarican run in which the VERAGUA will also be operated. The PETEN will enter the same service next February. Articles fully describing this class of ship appeared in January and July, 1932 MARINE REVIEW.

Ship and Boat Building

A total of 898 steam, motor, sail, unrigged and yatching vessels of 221,907 gross tons was built in American shipyards during the fiscal year ending June 30, 1932, according to A. J. Tyrer, assistant director of the bureau of navigation and steamboat inspection. This number includes all vessels of 5 net tons and over.

The statistical compilation of the bureau shows that in the commercial class there were 31 steam vessels of 138,712 gross tons, 492 motor propelled vessels of 25,908 gross tons, 2 sailing vessels of 18 gross tons, and 197 unrigged vessels of 48,254 gross tons. Total construction for the year was classified as follows: The combined merchant and pleasure vessels of metal construction was 115 vessels of 178,663 gross tons and the wood vessels 783 of 43,244 gross tons.

Classified geographically, the merchant vessels are distributed as follows: 414 vessels of 185,788 gross tons listed under Atlantic and Gulf ports, 153 vessels of 9741 gross tons under Pacific ports, 70 vessels of 11,813 under Northern Lakes ports and 85 vessels of 5550 gross tons on the Western Rivers.

To Build Fast Cutters

A report from Mexico City states that the President of Mexico has approved a project of the federal government to spend approximately $5,900,000 for the building of 20 light coast guard cutters. Plans have been prepared by the ministry of war and marine, but the purpose of the fleet is to guard the coast line of Mexico from the activities of smugglers and foreign "pirate" fishers. The new cutters are expected to have considerable speed and total displacement tonnage of the 20 is 12,000 tons. In local marine circles in Mexico it is believed that the orders will be placed in American shipyards.

Launching of Washington

Sponsored by Mrs. T. V. O'Connor, wife of the chairman of the United States shipping board, the T. S. S. WASHINGTON, sister ship of the MANHATTAN was launched at the yard of the New York Shipbuilding Co., Camden, N. J. at 5:41 p.m. Aug. 20. The water used for christening was taken from a well at Mount Vernon. A distinguished group of guests and a crowd of 8000 visitors witnessed the launching of this second great ship for the service of the United States lines in the North Atlantic.

Since this issue is largely devoted to a description of the MANHATTAN, it will not be necessary at this time to say much about the WASHINGTON, except that every attempt will be made to make her even superior to her sister ship in a number of minor improvements. The WASHINGTON will have accommodations for 1250 passengers and is expected to join the MANHATTAN in the United States lines New York-Hamburg service early in May, 1933. The ports of call in this service are Cobh, Plymouth, Havre and Hamburg, eastbound and Havre Southampton, Cobh and New York, westbound.

Diesel Electric Tug

Named DEARBORN, the new 85-foot diesel electric tug, built for the Ford Motor Co. at the yard of the Great Lakes Engineering Works, River Rouge, Mich., has been placed in service. This vessel was designed by Henry J. Gielow, Inc., is of all steel construction and is fitted with two 330 horsepower Cooper-Bessemer diesel engines driving generators supplying current to one 500 horsepower propelling motor. The diesel engines used are among the first to be fitted with the new atmospheric relief fuel injection system developed by Cooper-Bessemer to eliminate all exhaust smoke and to minimize engine noises.

Engineers Request Bids

The United States engineer office, 39 Whitehall street, New York is asking for bids on the construction of a timber dock at the United States construction yard, Piers 35 and 36, lumber district, Albany, N. Y. Bids will be opened 12 noon daylight saving time Sept. 19.

Bids will be received until 3:00 p.m. Sept. 7, for furnishing all labor and material and performing all work for remodeling and repairing the inspection boat, GENERAL HUMPHREYS. Bids are to be sent in to the United States engineer office, first New Orleans district, New Orleans.

The United States engineer office, 1068 Navy building, Washington, D. C. invites proposals until 3:00 p.m. Sept. 7, for furnishing all labor and materials and performing all work for constructing and delivering afloat one or two steel barges. Further information will be given on application.

James Callahan chief engineer of the wrecker FAVORITE, died at his home in Port Huron, Mich., on Aug. 7. He was 63 years of age.

New Bids to be Requested For Removing Barge

The bids opened on July 22, for the removal of the schooner barge SIMLA from Oakland estuary, Oakland, Calif. have been rejected and it has been decided to readvertise the work. New specifications, with the approval of the chief of engineers, were to have been issued sometime about the middle of August by the United States engineer office, 401 Custom House, San Francisco, Calif. Provision will be inserted allowing for an alternate bid on shifting the wreck so that it will lie behind the bulkhead line.

Bids were received by the United States engineer office, Memphis, Tenn., up to Aug. 17, for construction and delivery afloat at Memphis, Tenn., of one 160-foot floating drydock. As this is written no word had been received with reference to placing a contract.

Carferry Line Abandoned

The interstate commerce commission has authorized the abandonment of the carferry line from Conneaut, O. to Port Stanley, Ont., operated by the Marquette & Bessemer Dock & Navigation Co. The distance across the lake at this point is about 59 miles. Discontinuance of the service is due to the continual losses sustained by the company in its operation. These losses are said to have totaled over $280,000 in the last eight-year period.

Norfolk Pilots Buy Boat

The Norfolk Pilots' association recently purchased a 125-foot auxiliary schooner yacht, built for Arctic exploration work. This vessel is less than two years old and was formerly owned by F. H. Rawson, Chicago. She was constructed to participate in an expedition planned by Commander Donald B. McMillan. The sale was made through Henry J. Gielow, Inc.

She is of the Gloucester fisherman type, heavily constructed and is powered with one 275 horsepower diesel engine. In her new service she will be one of the most pretentious of any of the pilot boats owned along either coast. She has three double and two single staterooms, three baths, a large dining saloon and living room. Fuel tanks have a total capacity of 5000 gallons and an equal quantity of fresh water can be carried.

West Coast Lighthouse

Anacapa island lighthouse, off the California coast, the most difficult to build of all Pacific coast lighthouses since the erection of the famous St. George reef lighthouse and some of the Alaskan stations, has been completed and was placed in commission early last spring. Anacapa, because of its isolation on a small island 60 miles from Los Angeles, where heavy seas sometimes make landing impossible for many days at a time, has been under construction for over two years. It will be a valuable aid for both transpacific and coastwise vessel traffic, marking the southern entrance to the Santa Barbara channel.

The completed station consists of a concrete light tower about 40 feet high, four dwellings for the keepers, a 50,000 gallon capacity water tank, a power house, oil house, and other small buildings. The new light will have a candlepower of nearly a million and because of the height of the land on which the tower stands, will be 274 feet above the water. During times of fog, the air diaphone fog signal will sound a powerful blast every 30 seconds. The station also sends out radiobeacon signals at regular intervals both night and day in clear weather and during fog these signals are emitted continuously.

Terminal Charges in U. S.

A supplement to the 1931 edition of miscellaneous series report No. 1, entitled *Port and Terminal Charges at United States Ports*, has been issued by the board of engineers for rivers and harbors of the war department, in co-operation with the United States shipping board.

Lighthouse Commissioner Order Two Tenders

Late in July the commissioner of lighthouses of the department of commerce awarded contracts for the construction of two new lighthouse tenders. The first of these, the ARBUTUS, a twin screw vessel, for use on the coast of Maine and New Hampshire, was awarded to Pusey and Jones Corp., Wilmington, Del. on a low bid of $239,800 and delivery in 300 days.

The second of these two vessels, the WISTARIA, which will be used in the waters of Delaware bay and river, was awarded to the United Dry Docks, Inc., New York at a low bid of $129,900 with delivery in 240 days.

The ARBUTUS will be 174 feet in length and will have 1000 horsepower. She is of entirely new design and is intended for service to relieve buoys, carries supplies to lighthouses and for the construction of aids to navigation. The WISTARIA is a sister ship of the new tenders LINDEN and COLUMBINE. She will have 240 horsepower applied to a single propeller and will be 121 feet in length.

Radio Direction Finders

Six additional vessels of the Merchants & Miners' Transportation Co. are being equipped with radio direction finders by the Radiomarine Corporation of America. Installation of this equipment is under way on the steamships VOLUSIA, WYOMING, PROVIDENCE, YORK, ESSEX and LAKE GLASCO. When this work is completed all the vessels of this company will be equipped with direaction finders of this type.

Announcement has been made by Capt. R. D. White, supervisor of the Port of New York that the ACTIVE, new patrol boat for the Port of New York, is nearing completion in Baltimore and would soon enter service, replacing the LAMONT, which is 35 years old. The new patrol boat is an all-steel vessel of 121 feet in length. Her diesel engines will give her a speed of 12 knots.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Aug. 18, 1932	4.50@5.00	.90	4.08
July 18,	4.50@5.00	.90	4.04½
June 18,	4.50@5.00	.80	3.70
May 18,	4.50@5.00	.75	3.70
April 18,	4.50@5.00	.70	....
Mar. 18,	4.50@5.00	.65	3.25
Feb. 18	4.50@5.00	.65	3.25
Jan. 18	4.50@5.00	.65	3.25
Dec. 18	4.50@5.00	.65	3.25
Nov. 18	4.50@5.00	.65	3.25
Oct. 18	4.75@5.00	.65	3.25

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Aug. 18, 1932	4.50@5.00	.90	4.04
July 18,	4.50@5.00	.90	4.08
June 18	4..50@5.00	.80	3.69
May 18,	4.50@5.00	.80	3.69
April 18,	4.50@5.00	.75	3.21
Mar. 18,	4.50@5.00	.65	3.21
Feb. 18	4.50@5.00	.75	3.45
Jan. 18	4.50@5.00	.75	3.45
Dec. 18	4.50@5.00	.75	3.45
Nov. 18	4.50@5.00	.75	3.45
Oct. 18	4.75@5.00	.75	3.45

Other Ports

Aug. 18, 1932

Boston, coal, per ton	$7.11
Boston, oil, f. a. s., per barrel	$0.76
Hampton Roads, coal, per ton, f.o.b., piers	$4.25
Cardiff, coal, per ton	13s 6d
London, coal, per ton	—s —d
Antwerp, coal, per ton	18s 0d
Antwerp, Fuel oil, per ton	67s 6d
Antwerp, Diesel oil, per ton	82s 6d
British ports, Fuel oil	67s 6d
British ports, Diesel oil	82s 6d

Delmundo Reconditioned

(*Continued from Page* 41)

new quarters just abaft of and opening into the new pilot house. Wireless equipment has been thoroughly overhauled in order to provide safe and sure communication with shore stations and other ships while at sea.

In order to provide the best possible foods of the greatest variety, new refrigerating rooms of increased capacity were built and a three-ton refrigerating machine of the York Mfg. Co. was installed. The galley was re-modeled throughout, increased in size and a new oil burning range was installed with ample capacity to take care of all possible requirements. Separate bakery and ample baking ovens are also provided for bread and pastry, etc. To eliminate soot and smoke on the decks the uptakes of the baking ovens and range have been led through the new and enlarged smokestack.

As an added safeguard a complete fire detecting system was installed in all spaces. The cargo spaces are fitted with the Rich smoke pipe fire detecting system and the quarters, storerooms, etc, are provided with the Zonit automatic electric fire alarm system. With these systems any eventual fire is immediately detected and its exact location determined. Excellent extinguishing facilities provide means of rapidly and successfully overcoming any fire which might break out in any part of the ship. In addition to other extinguishing facilities a complete Foamite fire extinguishing system has been installed in the engine and boiler rooms.

The outside appearance of the vessel has not been neglected and has been considerably improved by alterations to the smokestack, curving of the bulwark breaks leading from forecastle, poop deck, and from bridge deck to the forward and after well decks. Spurketing plates have also been added on the forecastle and poop. Altogether the changes in the outside appearance together with the addition of the new superstructure make the vessel completely unrecognizable as a Hog Island type ship.

Recording Thermometers for S. S. Manhattan

Recording thermometers of special design were required for installation on the T. S. S. MANHATTAN. These special instruments were furnished by Taylor Instrument Companies, Rochester, N. Y.

This thermometer equipment is used for taking temperatures inside of cold storage spaces in order to protect food stuff and other perishable articles, also, for taking a record of room temperatures in the main and tourist dining saloons. In all, 16 recording thermometers of the mercury actuated type were used. The thermometers are equipped with plain bulbs and have capillary lengths varying from 45 feet to 105 feet, which was the longest length required.

As the instruments to record temperatures in the cold storage rooms are installed on a central panel, the tubing in many cases run through sections of the ship where the temperatures will fluctuate above and below the temperature of the bulbs. This required accurate temperature compensation along the tubing, and was successfully taken care of by the use of special tubing which automatically counteracts or compensates for temperatures surrounding it.

The range of temperature covered, from minus 20 to plus 100 degrees Fahr. can best be recorded with a mercury actuated instrument. The ordinary mercury recorder would be subject to errors caused by the fluctuations along the connecting tubing which is successfully taken care of by the use of special tubing.

Another condition which had to be eliminated was the movement of the pen arm on the recorder induced by the rolling or pitching motion of the ship. This was overcome by special design in the movement of the instrument itself without affecting its efficiency.

Shipping Board Completes its Reorganization

THE United States shipping board, now composed of three members, on Aug. 10, completed reorganization of its administrative bureaus .The business of the board will hereafter be transacted in four bureaus and two offices; the bureau of marine development, bureau of regulation and traffic, bureau of construction and finance, bureau of research, office of general counsel, and office of secretary.

The Merchant Fleet Corp. remains a subsidiary agency to which the shipping board assigns all duties connected with the actual operation of the government's few remaining lines. Questions of policy affecting the Fleet corporation are determined by the shipping board.

Functions of the general counsel and the secretary are under the administrative supervision of T. V. O'Connor, chairman of the board, who also has charge of the bureau of marine development and the division of public information. To Commissioner Sandberg is assigned the bureau of regulation and traffic and the bureau of research, while Commissioner Cone will have supervision over the bureau of construction and finance.

No drastic changes have been made in the shipping board's functions, which for the most part are mandatory by law. The reorganization is a realignment, rather than a revamping, of the board's responsibilities with respect to the merchant marine. In the reorganization it is recognized that the dwindling activities of the board's Merchant Fleet Corp. forecast the early liquidation of the government's remaining vessel property and the growing importance of the board as a regulatory and promotional body.

Baltimore Ranks Second

Baltimore's import tonnage declined drastically, although the approximate 4,000,000 tons handled during the year was sufficient to maintain second national ranking in this trade. The year's imports here were 3,949,127 tons compared with 5,502,169 tons in 1930. New York's imports dropped to 12,561,313 tons, from 15,318,601 tons for the preceding year, and Philadelphia declined to 3.168,096 tons from 4,209,169 tons. The New Orleans drop in imports was from 2,929,598 tons in 1930 to 2,189,637 tons in 1931, while Los Angeles imports went to 536,495 tons in 1931, against 647,169 tons in 1930. In export tonnage Baltimore handled 793,180 tons in 1931, compared with 969,485 tons in the preceding year. New York's exports were 5.966,-914 tons last year, against 7,862,282 tons in 1930, while Los Angeles dropped to 4,321,790 tons from 5,854,936 tons. Philadelphia declined to 1,500,-983 tons from 1,775,323 tons, and New Orleans decreased to 1,912,034 tons from 3,088,445 tons.

Breaking all previous records for early arrival of winter storage grain, the steamer PONTIAC of the Cleveland Cliffs Iron Co. reached Buffalo Aug. 9. The record was established last year by the arrival of the steamer MINCH on Aug. 17.

Captain MacKenzie Retires

The retirement recently, of Capt. James W. MacKenzie, resident superintendent for Furness Bermuda line in Bermuda, marks the closing of another chapter and the loss of another of the old time "sea dogs" to shipping circles.

He was born in Pictou, N. S., April 11, 1865 and started his sea career as an apprentice on a sailing ship at the age of 16. After four years in sailing ships, he joined the Quebec Steamship Co. and worked his way to the top, becoming commodore captain.

When the Furness Bermuda line bought that company in 1919, Captain MacKenzie was retained as commodore captain and served in that capacity until 1928 when he left the sea to take over the position from which he retired.

Up and Down the Great Lakes

Ore Traffic at Low Point—Livingstone Channel—July Lake Levels
Lake Excursions — Few Vessels in Service — Welland Cannal

DURING the month of July the total American lake movement in Lake Superior iron ore totaled 639,884 tons compared with 4,956,061 tons for the month of July, 1931. Up to Aug. 1, this year, the total movement of iron ore was 1,028,340 tons, compared with 10,709,320 tons in 1931 up to Aug. 1.

Total traffic through the Canadian and United States locks of the Sault Ste. Marie canals for July this year was only 2,637,538 tons, compared with 7,612,657 tons in July, 1931. The decrease in iron ore tonnage was 4,454,-571 tons or from 5.071.655 tons to 617,-084 tons. Soft coal shipments for the month of July, this year, totaled 847,-038 tons as compared with 1,484,032 tons for the same month last year. Wheat, however, increased to 25,013,-804 bushels during July this year from 15,119,372 bushels for the same month last year. This increase amounted to 296,833 tons.

Traffic through the Welland ship canal is heavier this year than last, amounting to 1,029,828 tons for July, 1932 compared with 871,513 tons for July last year. Wheat shipments for July this year amounted to 366,327 tons as compared to 161,957 tons for July, 1931. Rye increased by 34,212 tons, corn by 15,876, gasoline by 27,757 tons and coke by 51,110 tons. The large decreases were: soft coal, 83,470 tons; iron ore, 67,371 tons; only 5000 tons passing down this year, oils, 41,661 tons and barley, 28,064 tons.

In the St. Lawrence canals traffic for July this year amounted to 822.373 tons which was 105,387 tons more than in 1931. Wheat increased from 114,486 tons last year to 325.334 tons in July this year. Rye also increased by 33,629 tons, but barley was lighter by 24,939 tons; soft coal by 51,945 tons and sand by 77,813 tons. Total traffic for 1932 to July, 31 amounted to 2,890,251 tons compared with 3,121,490 tons in 1931.

The Livingstone Channel

In order to carry on the dredging operatons, part of the Livingstone channel, from Upper Entrance light to Bar Point light, has been closed to navigation. It is estimated that the work intended will take about four years. In the meantime both upbound and downbound traffic will use the Amherstburg channel. The Lake Carriers association has issued a bulletin urging strict observance of the regulations covering the use of this channel. These regulations have been published in supplement No. 2 to Lake Survey Bulletin No. 41. On the coastguard devolves the responsibility of seeing that the regulations are followed by all craft using the channel. By reasonable care and proper observance of all safeguards, it is certain that no difficulty will be experienced in using the Amherstburg channel for two-way traffic.

July Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of July as follows:

Lakes	Feet above mean sea level
Superior	602.68
Michigan-Huron	578.66
St. Clair	574.22
Erie	571.75
Ontario	245.90

Lake Superior was 0.28-foot higher than in June and it was 0.44-foot higher than the July stage of a year ago.

Lakes Michigan-Huron were 0.02-foot higher than in June and they were 0.49-foot lower than the July stage of a year ago.

Lake Erie was 0.12-foot lower than in June and it was 0.06-foot higher than the July stage of a year ago.

Lake Ontario was 0.15-foot lower than in June (since 1860 the July level has averaged 0.04-foot lower than June); and it was 0.63-foot higher than the July stage of a year ago,

Excursions are Popular

Cheap excursion trips are providing the chief attraction to lake travelers out of Chicago. While there has been a substantial decline in over-night trip passengers, business in the one-day trips is off only about 10 per cent since a year ago. Freight business has been quiet but showed a slight improvement in August. Trucks continue to offer stiff competition to the steamship lines, particularly in the movement of fruits and vegetables.

A $1 excursion to St. Joseph and Benton Harbor has proved extremely popular this year, on some occasions it having been necessary to turn passengers away. This is an all-day trip and its economy has a special appeal at this time.

Honor Retiring Inspectors

On Aug. 4, the Lake Carriers association tendered a dinner in honor of Capt. N. B. Nelson and Silas H. Hunter, recently retired respectively, as supervising inspector and local inspectors of boilers in the ninth district of the United States steamboat inspection service. Newton D. Baker, general counsel of the association presided and Dickerson N. Hoover, supervising inspector general of the steamboat inspection service paid a fitting tribute to the two guests of honor.

Few Vessels in Service

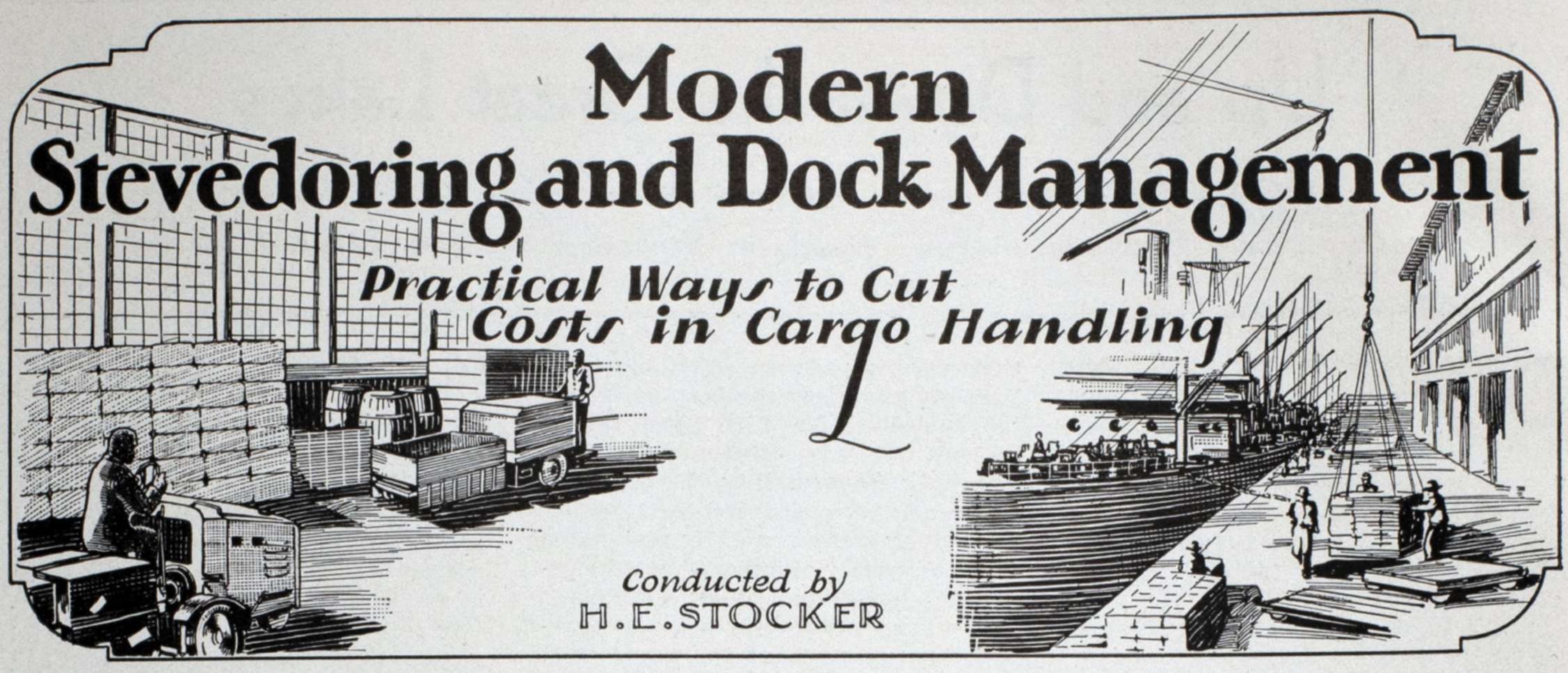
Of the 332 ore carriers, having a total trip capacity of 2,780,500 tons under the American flag on the Great Lakes, only 76 of 638,900 tons capacity were in commission on Aug. 1. This represents 22.98 per cent of the total fleet. However, only a little under 23 per cent of those ships in commission are carying ore. The month of August will naturally see a further realignment in this percentage.

Welland Canal Ceremony

Official opening of the Welland canal between Lakes Erie and Ontario was celebrated with due pomp and ceremony on Aug. 6. Participating in the ceremony were Lord Bessborough, governor general of Canada, Prime Minister R. B. Bennett; Hon. R. J. Manion, minister of railroads and canals and many of the empire delegates attending the Ottawa conference.

As a matter of fact the canal was really opened for use last year and has been in regular operation all this season. One of the features of the opening ceremony was the transiting of the Canada Steamship lines great freighter LEMOYNE, largest ship in the world on inland waters. She is said to have transited the canal with over 53,-000 bushels of wheat on board and drawing 20 feet.

The Cleveland office of the Great Lakes Engineering Works, Detroit, has been removed from the Union Trust building to the Rockefeller building. The Cleveland office is in charge of John T. Webster, vice president.



Profitable Ship Operation May Depend on Cargo Handling Methods

By H. E. Stocker

THIS subject was discussed at length in the paper presented before the 1930 meeting of the Society of Naval Architects & Marine Engineers, also in a paper before the Society of Terminal Engineers. It has also been discussed in part in articles in MARINE REVIEW, the first of which appeared in September, 1929.

Ships' port time saved is more important in most cases than a reduction in stevedoring costs. This is not a matter of opinion, it is a question of fact. The tests of whether port time exceeds a proper amount is determined first, by comparing with similar or comparatively similar operation; second, by a thorough analysis of comparative methods to ascertain if present methods can be changed in such a manner as to make possible a profitable reduction in port time.

A thorough analysis can be made of all the details of the operation and also the alternative plans suggested. Many errors in business judgments arise from a failure to look at all aspects of the case. The facts obtained should be set down in a manner to bring out the essential points.

Study Each Plan in Detail

A brief describing each plan in detail is of the greatest possible assistance in making a thorough analysis. A person may think that a thorough analysis has been made. However, such an analysis should be written describing the operation step by step, concisely trying to cover every point with care. It is surprising how much is developed by this method of analysis that would otherwise be overlooked.

The written analysis is useful in arriving at a plan of action which will produce the maximum profit. One essential point is to get the best balanced expenditure and profit.

Writing out plans of operation enforces fact thinking and honest minded facing of realities. To obtain the best profit results, every problem in management should be analyzed without prejudice or desire for personal advantage.

Prejudiced or superficial studies can be as destructive to operating efficiency, accuracy of cost competitions and agreeableness of human relations, as superficial studies of a civil engineer can be dangerous for the safety and permanence of a bridge.

Another method in attacking a problem of this character which has proved successful is to submit the alternative plans to criticism of captains, mates, the traffic department and anyone else who may contribute either facts or new ideas which will help to arrive at the most economical plan of operating the ships. It is often found that employes in inconspicuous positions are in reality experts on some particular subjects. Occasionally valuable information can be obtained from outsiders—equipment, salesmen, marine trade papers and engineers. Trust and receptiveness to ideas and criticism are the keynote of good management.

Balancing Outgo and Income

The primary function of a financial budget is to maintain a proper balance between financial requirements of a business or a part of a business. Adequate profits are best attained by spending money where it will do the most good. That can be determined with a fair degree of accuracy only by a carefully developed plan to which the name budget is given. Operating under a budget, all expenditures are made with reference to all other expenditures. Regardless of how much an expenditure may be justified, in and of itself, by a department head, the expense is not authorized until the expense is studied with reference to the request of all other parts of the business.

In the same way a written analysis should be made of every alternative plan for the operation of a fleet of ships to avoid accepting a plan that will fail to yield the maximum profits. This does not mean that business judgments are entirely avoided and the analysis does everything. This method of attacking problems of ship operation is only an additional tool and assists in avoiding errors in judgment.

Port time can be expedited in various ways: First, improved methods and facilities that may be provided

at small cost may reduce time enough to operate the schedule with less steamers. It is possible that present methods need little change but the provision of additional pier space may be the solution. If a ship with five hatches is restricted to the use of two or three hatches because there is insufficient space on the pier for the cargo that could be handled by five gangs, then it is wise to analyze the schedule to ascertain if the reduction in terminal time possibly by increasing the tons discharged and loaded within a given time will make it possible to reduce the number of ships in operation.

Establish Limiting Conditions

Five hatches will discharge 150 tons an hour—over 1000 tons in eight hours allowing for short hatches—only if there is space on the pier to put the cargo. At this rate 2500 tons of cargo could be discharged in 20 working hours. If the ship arrives on Wednesday at 7:00 a.m. and starts working at 8:00 a.m. she will be discharged at noon Friday. Working four hours overtime Saturday afternoon she will then have Friday and Saturday to load say, 1200 tons of general cargo at 20 tons a hatch per hour. If lack of pier space make it possible to work only three hatches port time is much greater.

Additional terminal space may be procured by using a larger amount of space on the present terminal, by moving to a larger terminal and by obtaining a supplementary terminal. A part of the cargo may be discharged at an extra terminal especially suited for handling a specific commodity while the balance of the cargo is handled at the regular terminal.

The reverse example is when it is necessary to improve cargo handling facilities on the ship to make possible maintenance of schedule with less ships. It is possible that class of cargo is such that 40 tons cannot be discharged per hatch hour with ordinary ship's gear.

The problem then is what can be done to improve ship's gear. When it is necessary to frequently shift from offshore to inshore and vice versa, work is expedited by either providing a third boom at each hatch or by utilizing dock gear. If dock gear is not already provided a spar can be rigged with blocks and falls fitted permanently. Hatch covers of improved design reduce time used in the work of covering and uncovering hatches.

Equipment to Suit Conditions

Fitting special blocks to the boom saves time in rigging hatch tents. Portable platforms hung over the stringpiece where aprons are too narrow to accomodate a truck or trailer, permits running truck or trailer over the edge of the terminal so that the slingload may be hoisted straight up. Delay is avoided in handling slingloads and cargo is not damaged by the slingload striking the side of the ship.

These portable platforms also make it possible to avoid delay and damage to cargo when a ship is discharging. All these changes can be made with relatively little expense. Under certain conditions the more expensive cutting of side ports is profitable. With normal conditions, if sideports pay for themselves within two years, the expenditure is justified. Under present conditions much less time would be advisable. This is something for each company to determine, based on its own operating and financial conditions.

Sideports increase the number of tons which may be discharged or loaded within a definite period. If hatches can discharge 150 tons an hour, four hatches and four side ports will discharge much more—possibly 300 tons an hour. This improved efficiency may make it possible to reduce the fleet and save enough ship operating cost to pay for the side ports in the remaining ships.

Improved methods of handling cargo on the terminal has proved successful in reducing ships port time.

Pier Management a Factor

In some cases a change in pier and stevedoring management has accomplished a reduction in port time. In other examples, equipping a terminal with modern cargo handling equipment has increased tons per hatch hour so that a greater number of tons of cargo were handled each day.

The speed of loading and discharging can be improved by increasing the slingload and by utilizing mechanical equipment to handle the heavy slingload on the pier and by a general refinement of methods.

All of these changes took place recently on a certain terminal. Formerly, a small slingload was loaded on a fifth wheel trailer of antique design. Then three to four men would struggle to move the loaded trailer to the pile. Under the improved methods, a heavier slingload is quickly moved from shipside to the pile by one man using a small gasoline tractor to haul modern rubber tired trailers.

Some Limiting Factors in Use of Cranes

Limits in the use of cranes depend on two factors: their size and their cost. Their use would be precluded for small areas, because larger space would be needed for them than the capital returns on the building through moved goods would justify. The purchase price and operating cost are no less conclusive. At present they are still so high, the high wages considered, as to preclude their use to the extent otherwise desirable. Thus a considerable intensification of traffic might be promoted here, which is necessary if an equilibrium is to be maintained with the increased crane efficiency. It is therefore to be hoped that the manufacturer and the handler may be able to meet half-way through a lowering in production cost through standardization and mass production on the one hand, and a satisfactory utilization of the operating facilities on the other.

Nevertheless, there are many quay enterprises or individual operating plants which entirely or in a preponderant degree make use of the electric and gasoline truck or piling machine in some way or other, not because their computations on operations have shown that their transportation-balance has been benefited by it, in itself, but rather because they have figured out a progressively scientific intensification of their aggregate plant. That is the correct standpoint.

The gist of the matter is not whether the use of a power truck for a stretch of 200 feet or 400 feet offers arithmetical advantages as against the hand truck, but rather if it can be shown at the end of the year that the mechanization can make possible the clearance of a greater number of ships and tons of cargo. But it is clear, that the chief of the enterprise must also keep in mind his individual costs; for some advantages may, naturally, be bought too dearly.

The operation of a port is not a trade, it is an art, and the limits of efficiency in regard to the mechanization of hoisting and transporting can never be ascertained by mathematical formulas, but must be sought in the intimate knowledge of the traffic—and national-economic factors affecting the industry.

American Ship Operations

Thirty three per cent of all shipping companies operating under the American flag are one-ship enterprises, but these vessels comprise only 938,587 tons of the nation's total of 15,838,655 gross tonnage of documented vessels, according to A. J. Tyrer, assistant director of the bureau of navigation and steamboat inspection.

According to the bureau's survey, there are 12,309 owners of registered vessels controlling 25,156 bottoms, 20 of which own fleets of 100,000 tons or more and 48 of 50,000 or more.

The United States shipping board, with a fleet leased and otherwise, of 2,088,864 gross tons in 362 ships is the world's largest shipowner. This tonnage is more than twice that of all one-ship lines. A year ago, the shipping board had 397 vessels of 2,239,153 gross tons. All of these vessels are of 1000 gross tons or over.

Personal Sketches of Marine Men

George G. Sharp, Naval Architect, New York

By Ben K. Price

ROUNDING out forty years in the shipbuilding industry his training both academic and practical has been thorough and wide.

BESIDES technical skill he has brought to the art of shipbuilding an originality of treatment so necessary for true progress.

HE HAS contributed work of the highest order in the development of our modern American merchant marine during recent years.

IN OFFICES approached by winding staircase in a modern office building in downtown New York, overlooking the Hudson river, George G. Sharp, naval architect, engages in consulting practice. He was born in Birkenhead, England, of Scotch parentage. His early youth was spent largely in Glasgow, where he served six years apprenticeship with L. D. & W. Henderson, and where he was graduated from the Glasgow Technical college in 1898, specializing in naval architecture. He also spent four years in a responsible position with the Fairfield Shipbuilding & Engine Co., Glasgow, builder of passenger liners.

With this thorough foundation in shipbuilding, he came to this country in 1902 as chief draftsman for the Eastern Shipbuilding Co., New London, Conn. To this young naval architect, trained in the highly organized and efficiently equipped shipyards of the Clyde, this was an adventure; for the plant of the Eastern Shipbuilding Co., now the site of the New London Ship & Engine Building Co., had only newly been laid out on the meadows and confronting it was the construction of two of the largest vessels ever contemplated up to that time—the DAKOTA and the MINNESOTA, each of 22,000 tons deadweight.

In 1907 Mr. Sharp became affiliated as chief draftsman, with the Harlan & Hollingsworth Corp. later the Harlan plant of the Bethlehem Shipbuilding Corp., Wilmington, Del. In 1912 he went to the Seattle Construction & Dry Dock Co., Seattle, Wash., in similar capacity, serving two years before returning to his former position with the Bethlehem company. He remained until 1916, when he resigned to become chief surveyor to the American Bureau of Shipping, with headquarters in New York.

In this latter capacity, Mr. Sharp had under his jurisdiction the survey during construction, as well as approval of design with reference to structural efficiency and sea worthiness, of many hundreds of ships. His duties in this position took him through the hectic days of the World war, when more ships were launched than in any other period in history. He resigned in 1920 to engage in private consulting practice, establishing his present offices at 30 Church street, where numerous important jobs have since come off his boards.

Among the first of these was the conversion of several Hog Island "A" type vessels to molasses tankers, and oil tankers; and, the 4000-passenger Wilson Line day steamer STATE OF DELAWARE and STATE OF PENNSYLVANIA, launched in 1923. Two years later the 2400-passenger day steamer BEAR MOUNTAIN, operating on the Hudson river, followed from plans prepared by Mr. Sharp. In 1927 the Wilson Line day steamer CITY OF CHESTER was reconstructed under his supervision, her capacity being increased from 1400 to 2200 passengers.

Mr. Sharp's next important job involved the design and supervision of four new 9300 tons deadweight passenger and freight vessels EXCALIBUR, EXOCHORDA, EXETER, and EXCAMBION for The American Export Lines, New York, all for service in the Mediterranean trade. These vessels involved many new features and advances in shipbuilding art.

Shortly afterwards followed the reconstruction of two Hog Island "A" type vessels for the Mississippi Shipping Co., New Orleans, for operation in the South American trade. These ships were converted to carry 28 passengers each.

His last important reconstruction job called for the conversion, this year, of four freight vessels for the American Scantic lines. These last six vessels each provided accommodations of a most distinctive character for 75 passengers.

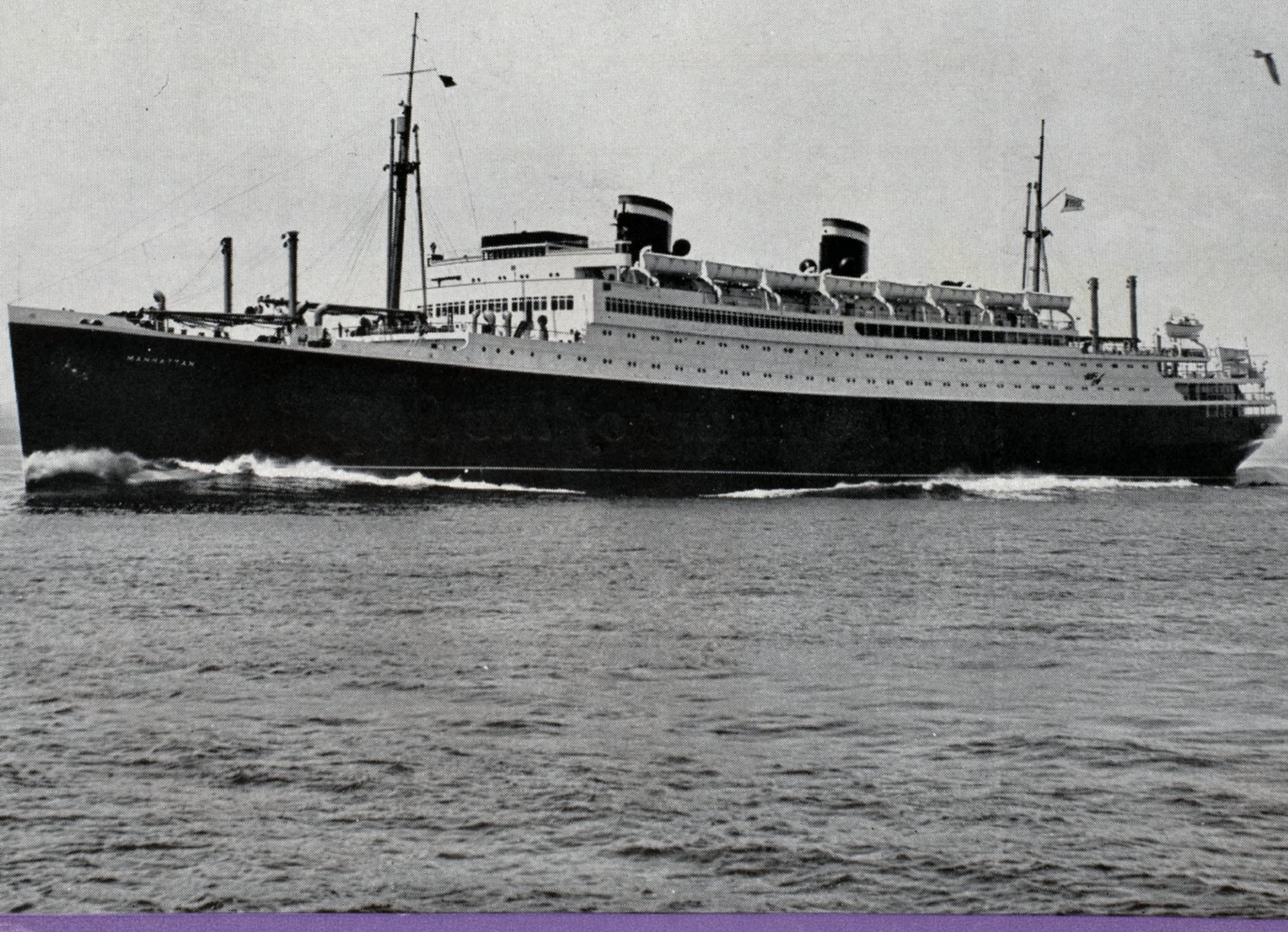
Mr. Sharp is a member of: Society of Naval Architects & Marine Engineers; The Institution of Naval Architects (London); committee on naval architecture, American Bureau of Shipping; and the Engineers club, New York City.

Marine Review

Reg. U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

September, 1932



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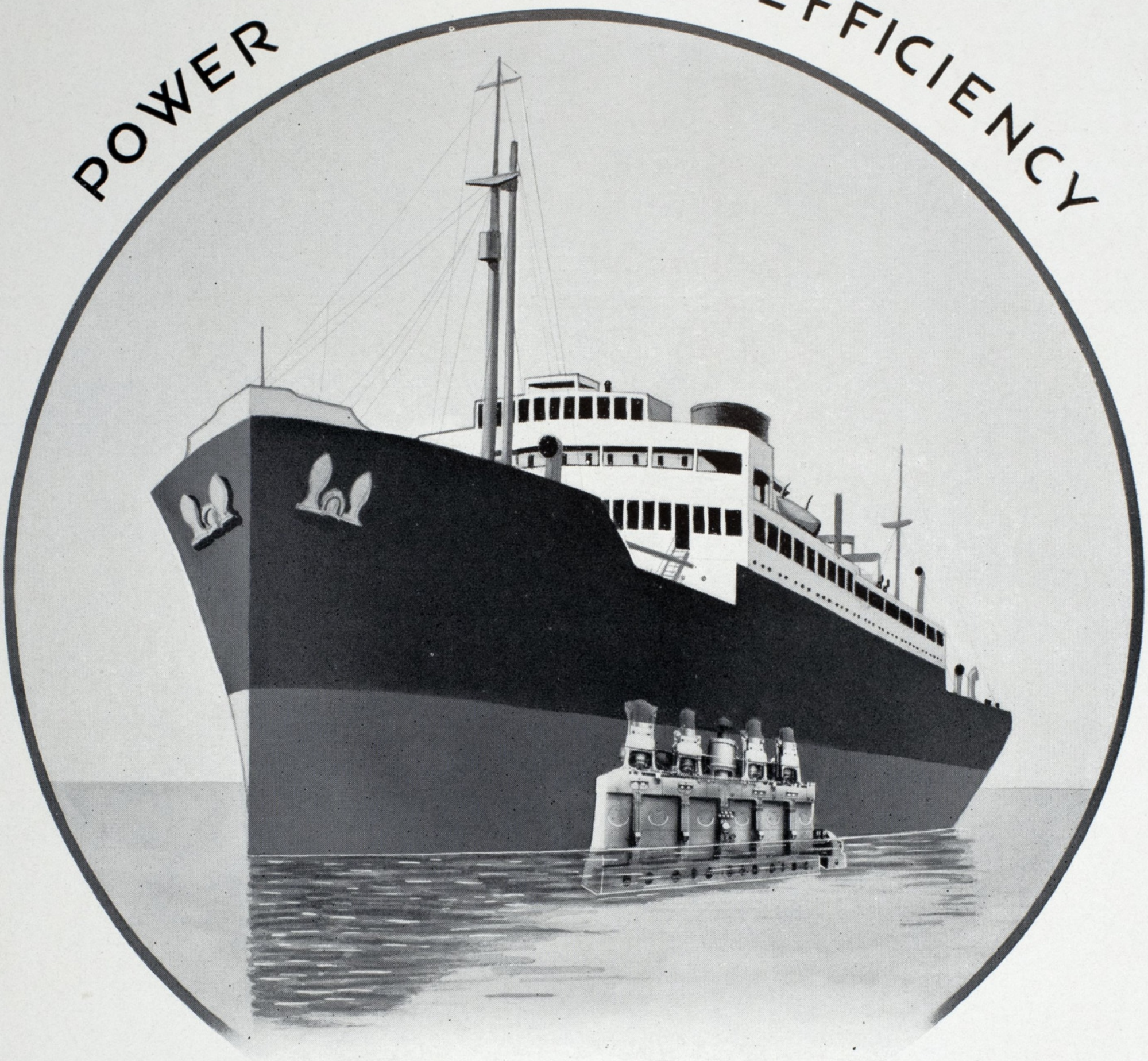

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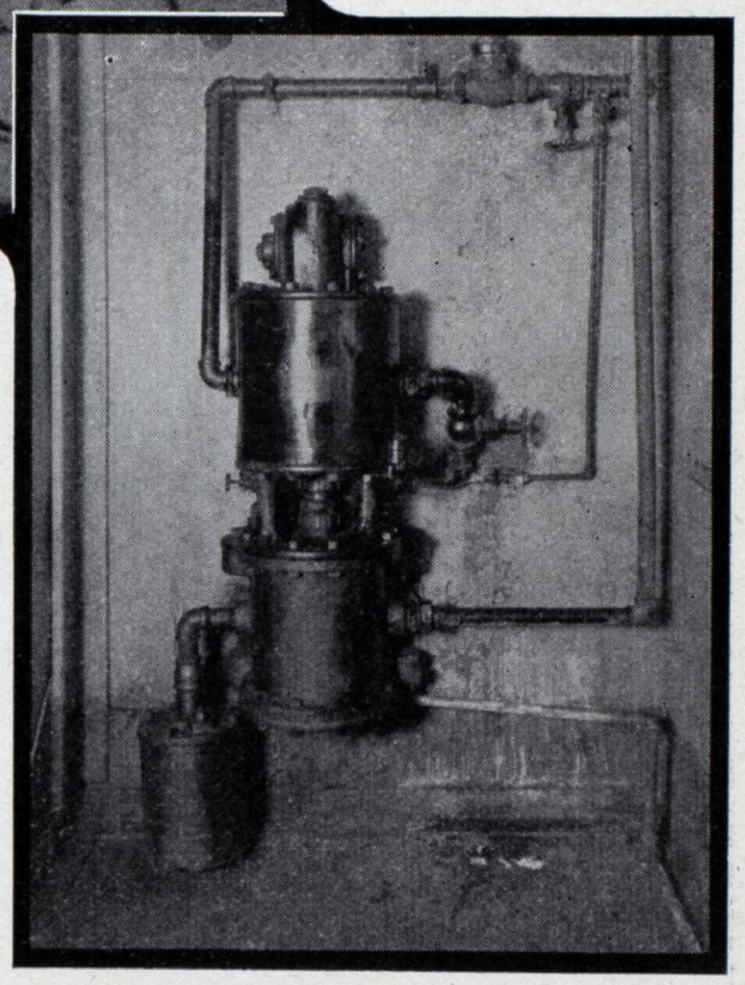

How to Keep Re-conditioned Ships In Ship-shape Condition

To meet the demands of modern service several steamship companies are having their vessels re-conditioned to provide for more efficient operation. Modification of lines, increase in power, addition of auxiliary equipment—these are some of the improvements being made.

The value of a source of compressed air on sea-going ships is now being more fully realized and many of the recently reconstructed boats have the Westinghouse Steam Driven Air Compressor. Among the fleets so equipped are those of the American Diamond Lines, the Scantic Line, the Pennsylvania Shipping Co., and the Waterman Steamship Co.

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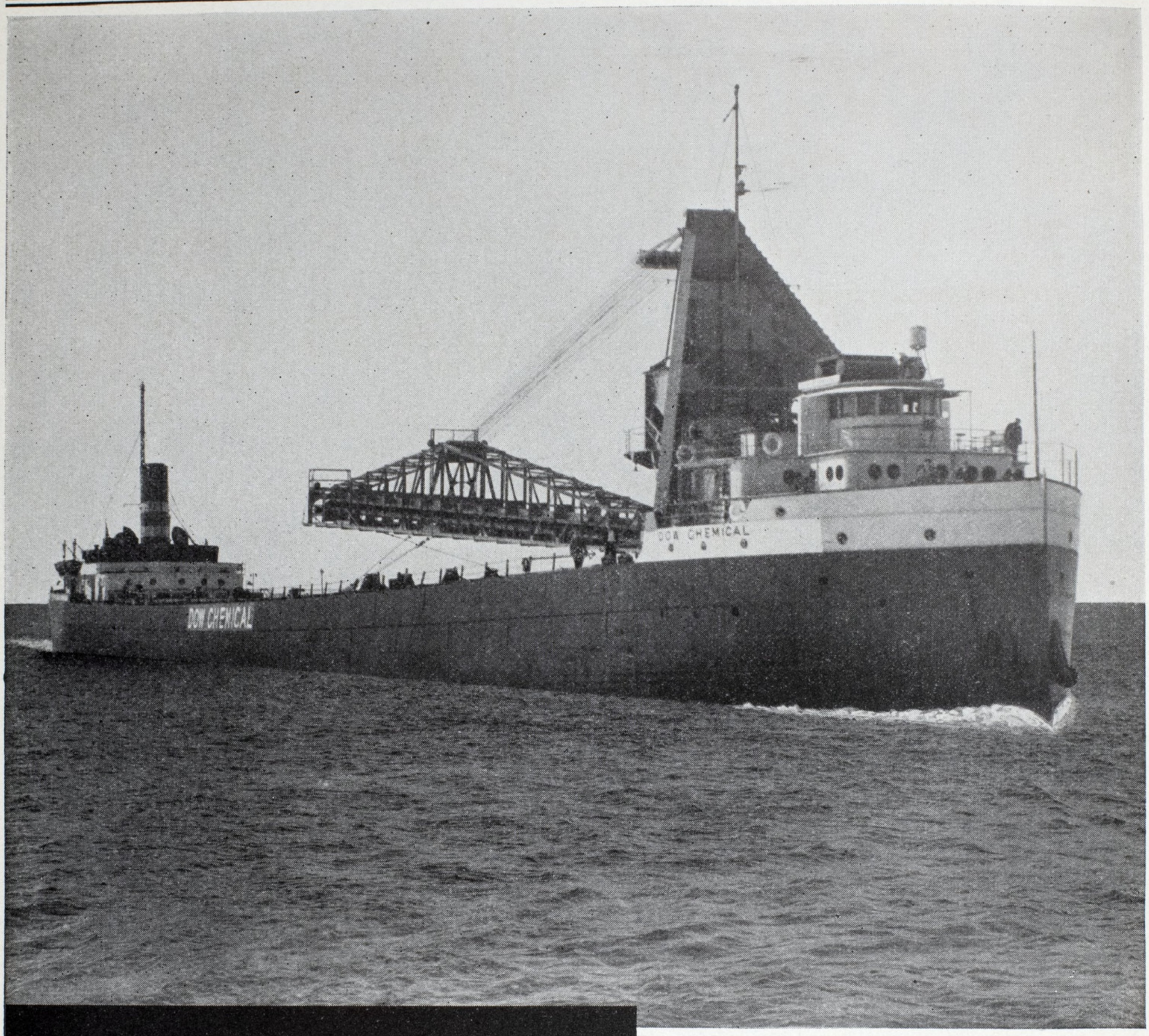

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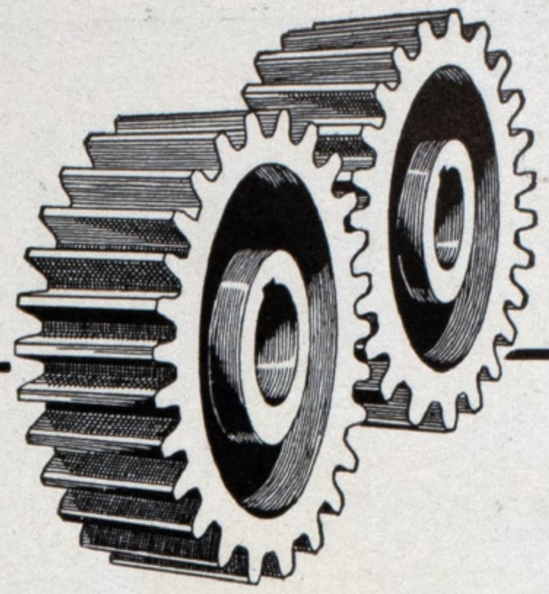

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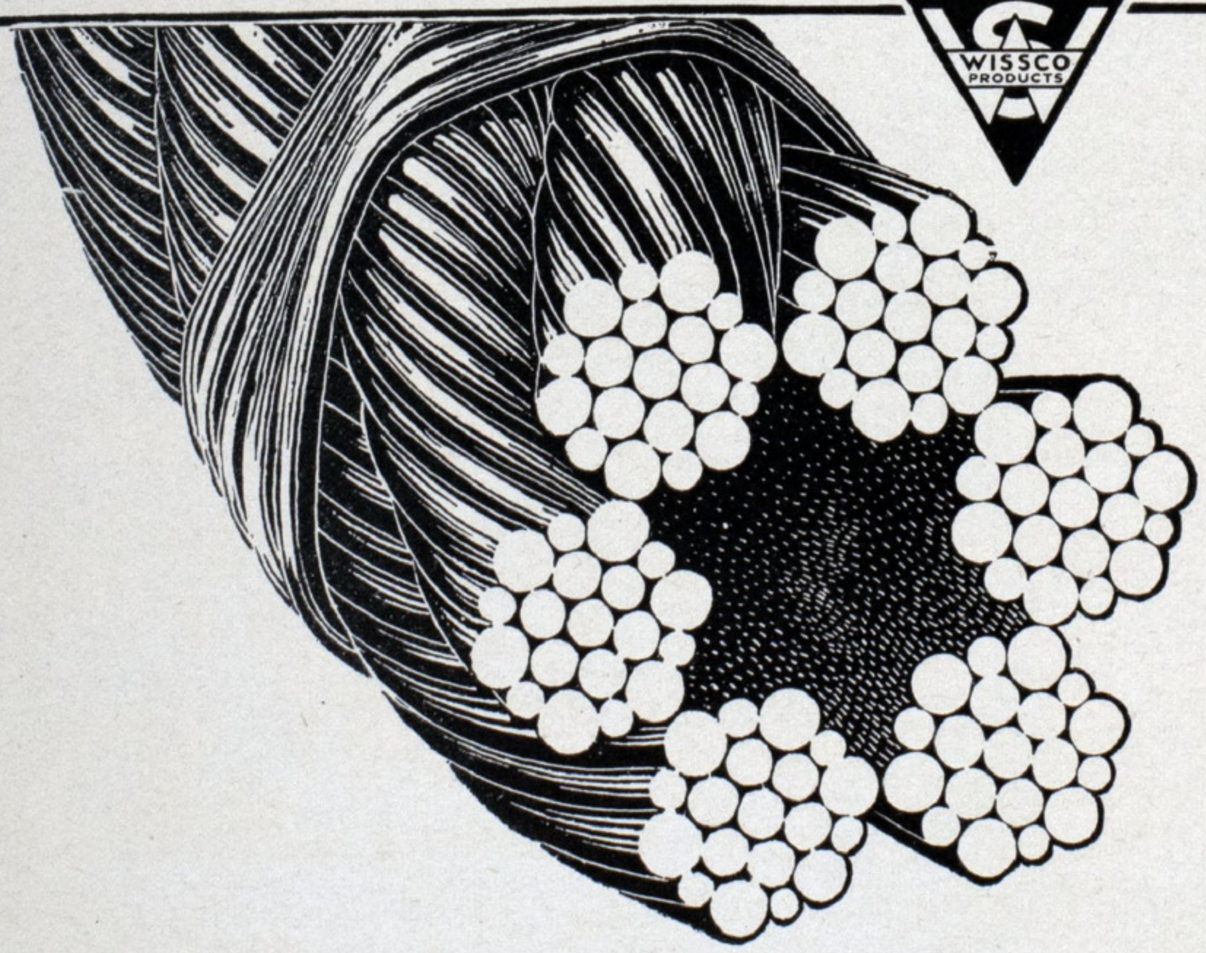

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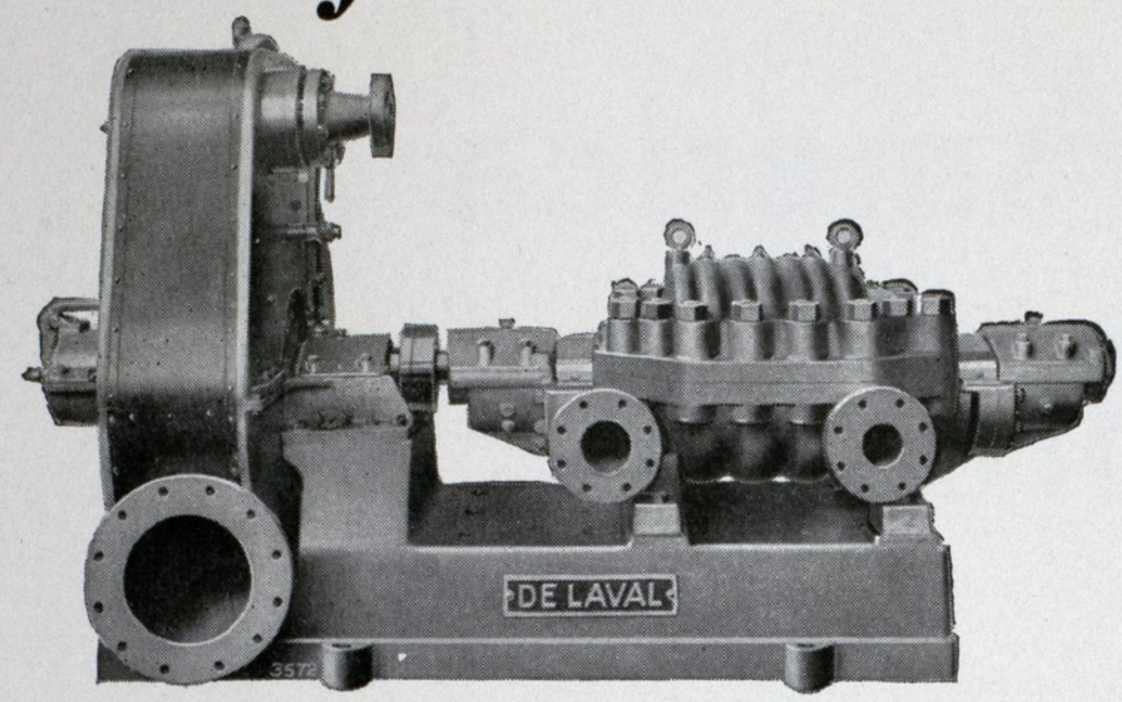

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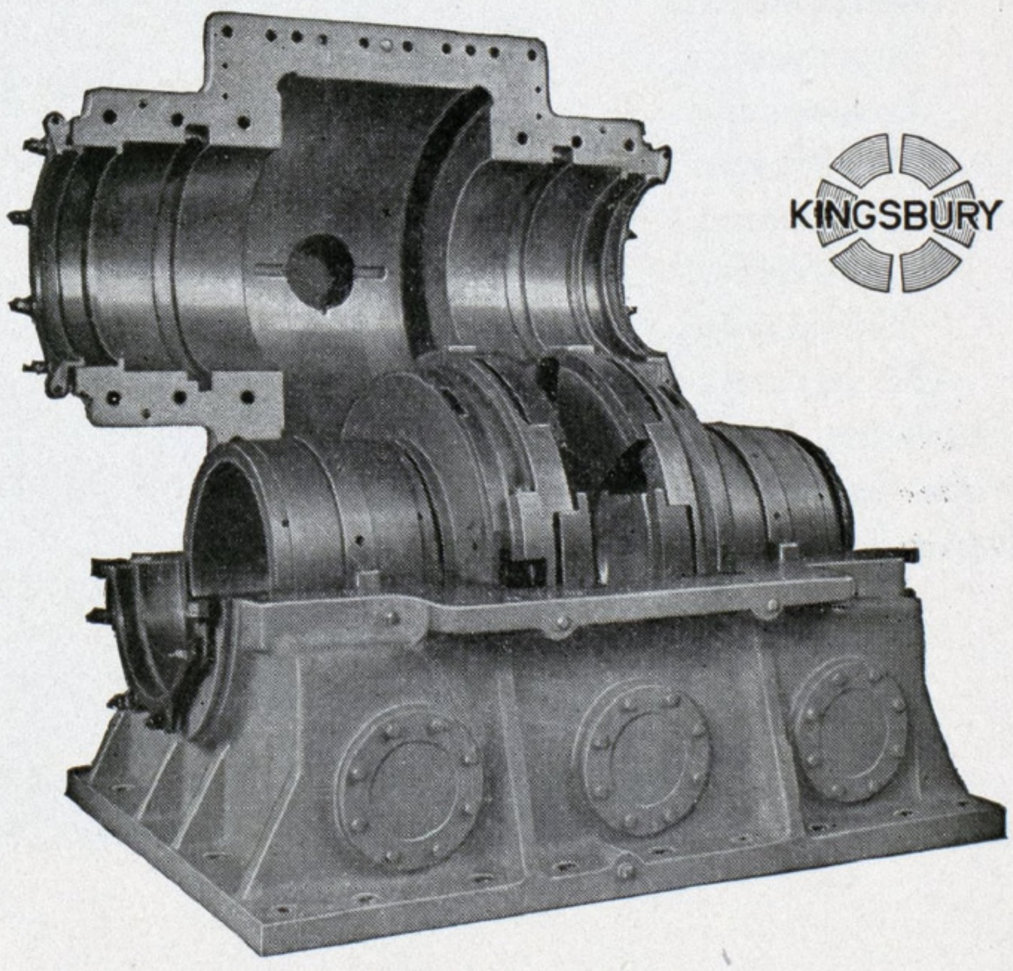

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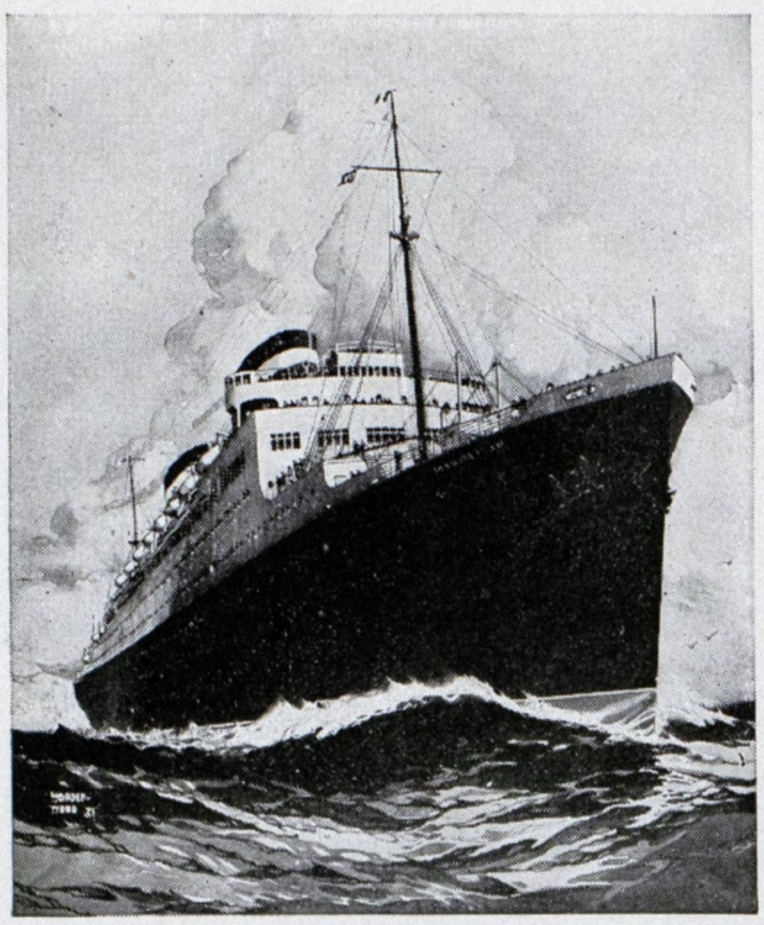

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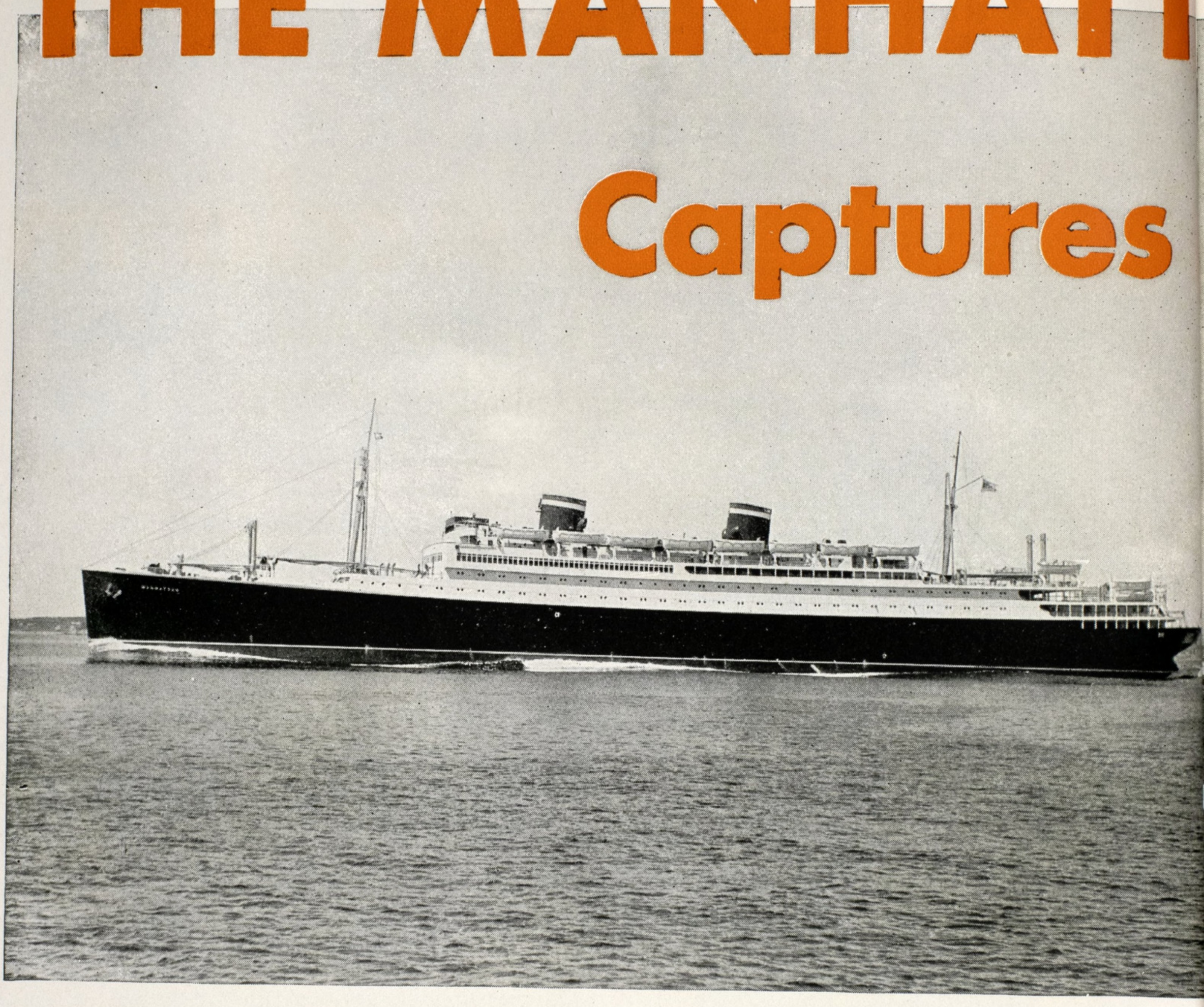
Captures



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Depth to Promenade Deck	75 feet
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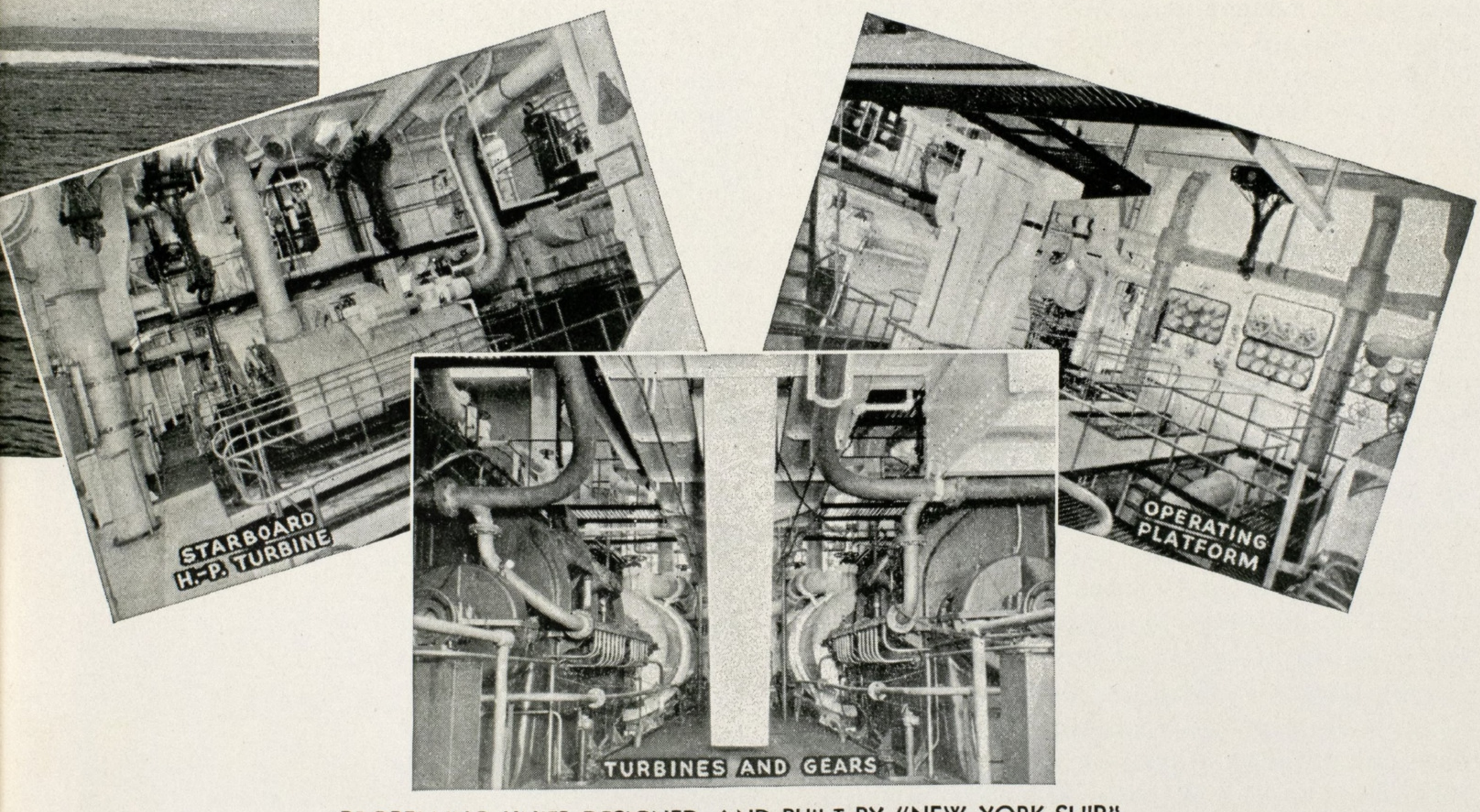
Shaft H. P. in Service	30,000 H. P.
Normal Speed in Service	20 knots

Passengers :—

Cabin	582
Tourist	461
Third	196
	1239
Crew	478
Total	1717



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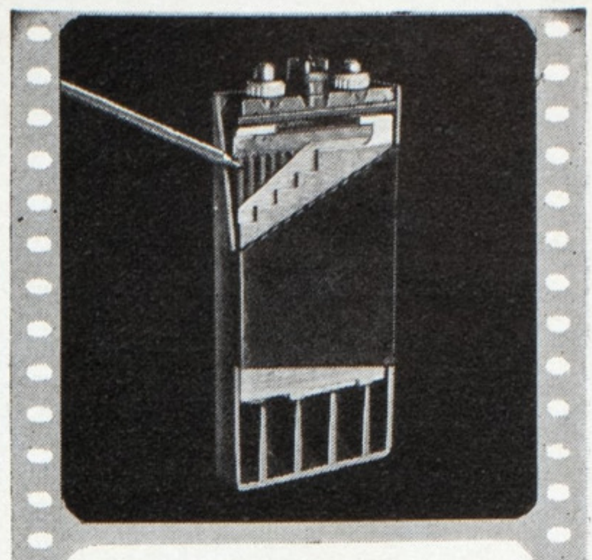
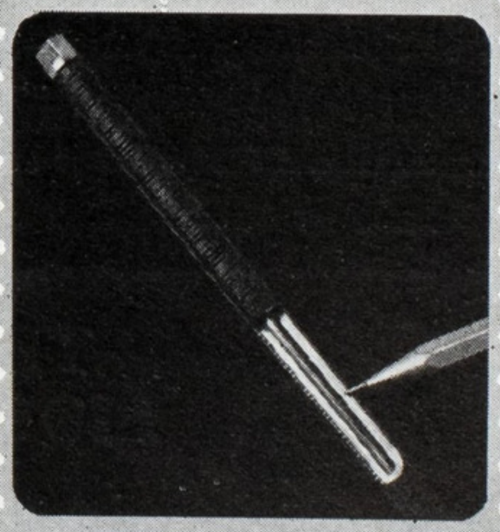
ONE OF THE REASONS for the long, economical life of the Exide-Ironclad Battery—the positive plate. The plate consists of a metal grid from which extend a number of parallel metal conducting rods. Surrounding each rod is a rubber tube slotted horizontally to permit the access of the electrolyte. Within the rubber tubes and surrounding the conducting rods is the active material of the plate.

OWNERS' EXPERIENCES PROVE that this Exide-Ironclad Battery for electric industrial trucks and tractors saves real dollars because of its long life of trouble-free service.



EXIDE - IRONCLAD CELL cut away to show a construction different from that of any other battery. Not made different just to be different, but possessing a construction that assures low operating costs and a long, active life of absolute dependability in material handling service. Pencil points to the positive plate.

ONE OF THE SLOTTED TUBES of which the positive plate is composed. Immersed in liquid it shows how the electrolyte meets the active material within the tube, through the slots in the tube, but does not wash it away. This construction gives the Exide-Ironclad Battery sustained power over an unusually long life period.



THE PENCIL POINTS to the active material within the slotted rubber tube. The cutaway section also shows conducting core rod running through the centre of the tube. The cylindrical construction of the tubes of the positive plate resists distortion because of the fact that expansion and contraction is equal in all directions.

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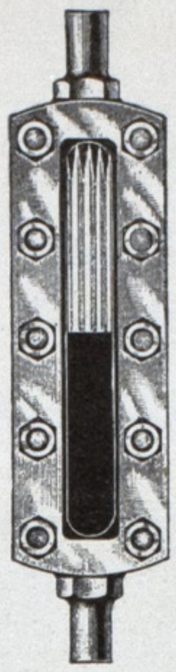

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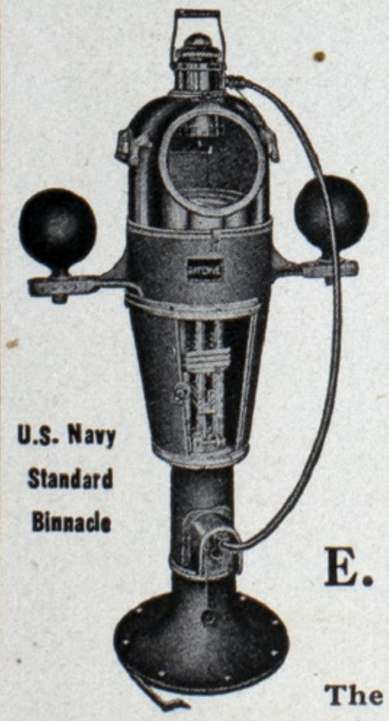

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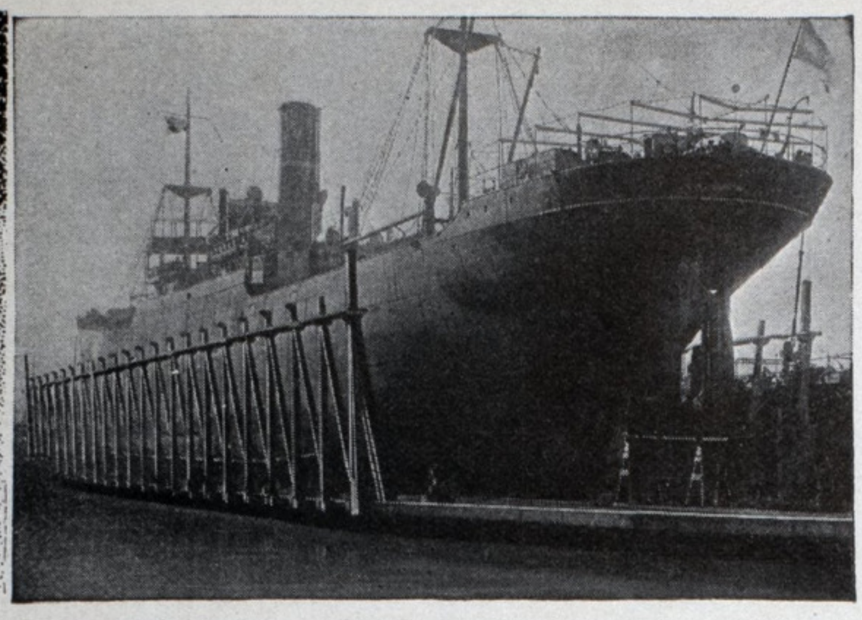

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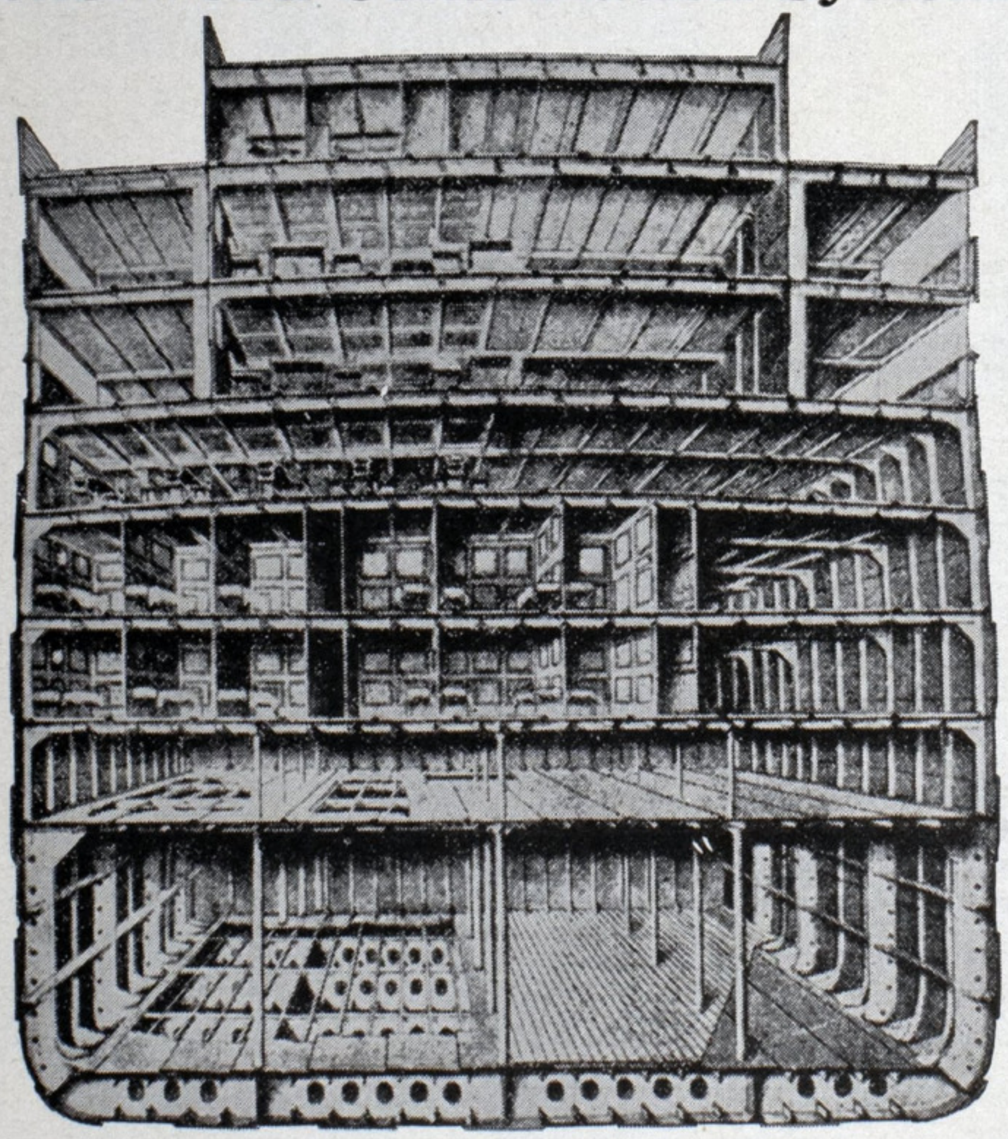
Isherwood Combination System



Sectional View of Interior of Passenger Liner designed on the Isherwood Combination System

(In a vessel of this type, deep transverses are recommended for hold construction, but are not essential.)

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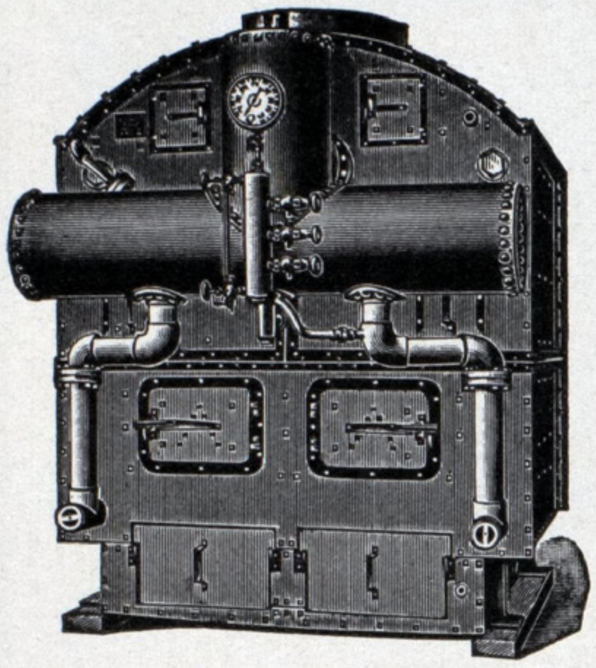

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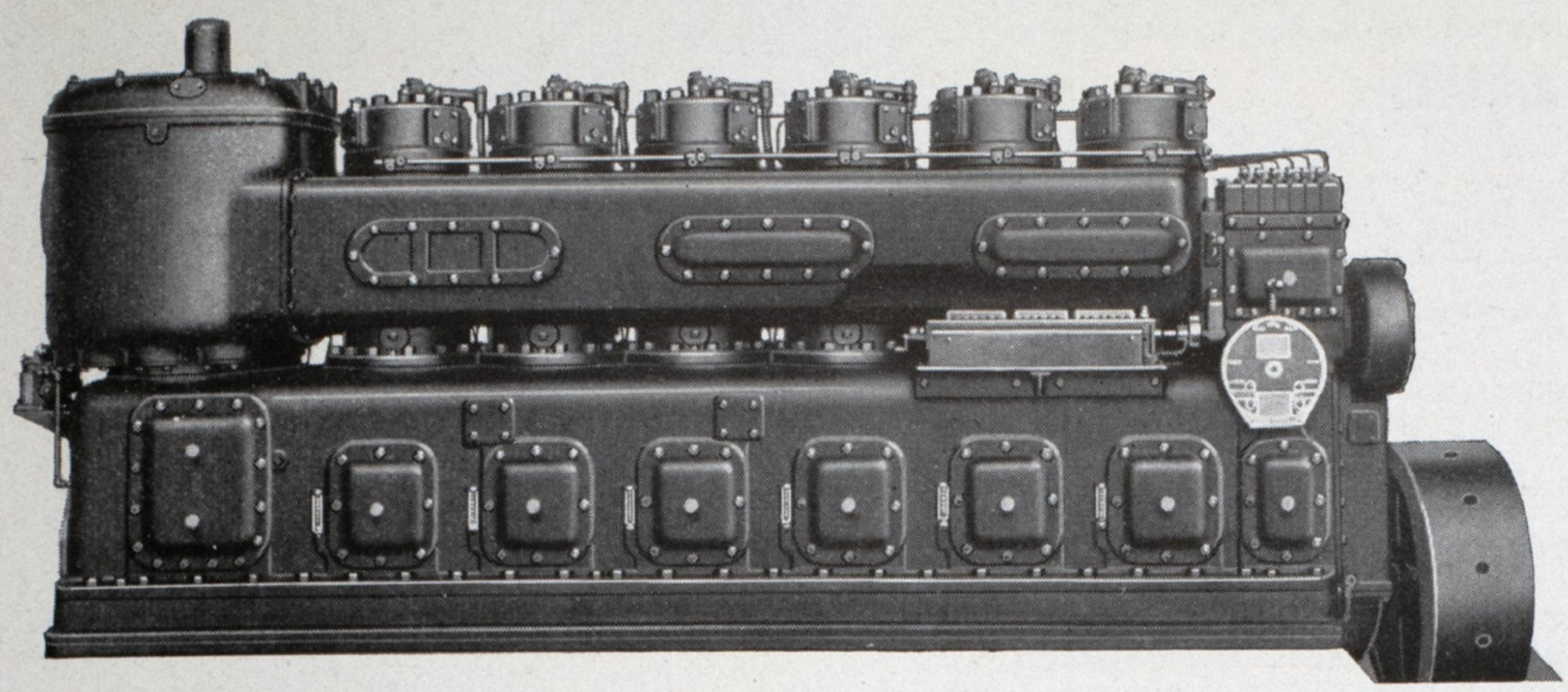
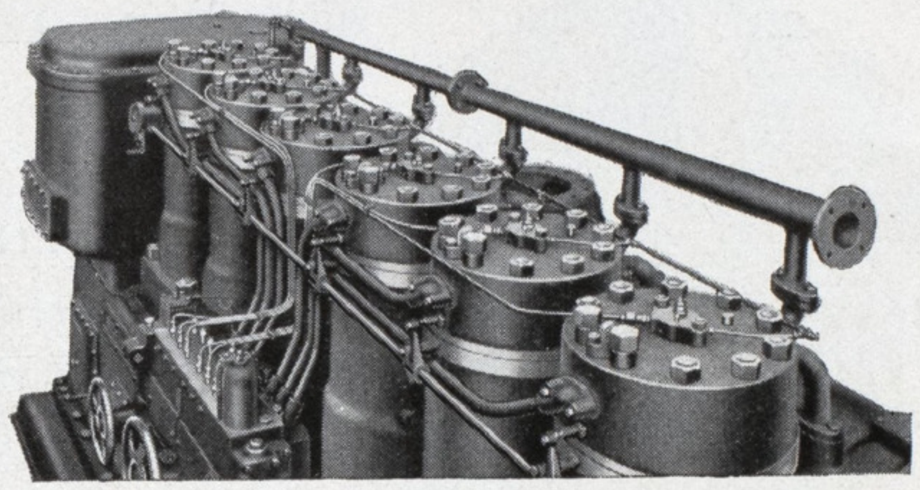


Six cylinder "Model 37" pump scavenging F-M Marine Diesel, direct reversible type. Sizes—250 to 1400 hp. Other engines down to 25 hp.

This view of the cylinder heads of an F-M Diesel illustrates the simplicity of construction and absence of complicated parts.



Start *first* with a Comparison of Diesel Principles..

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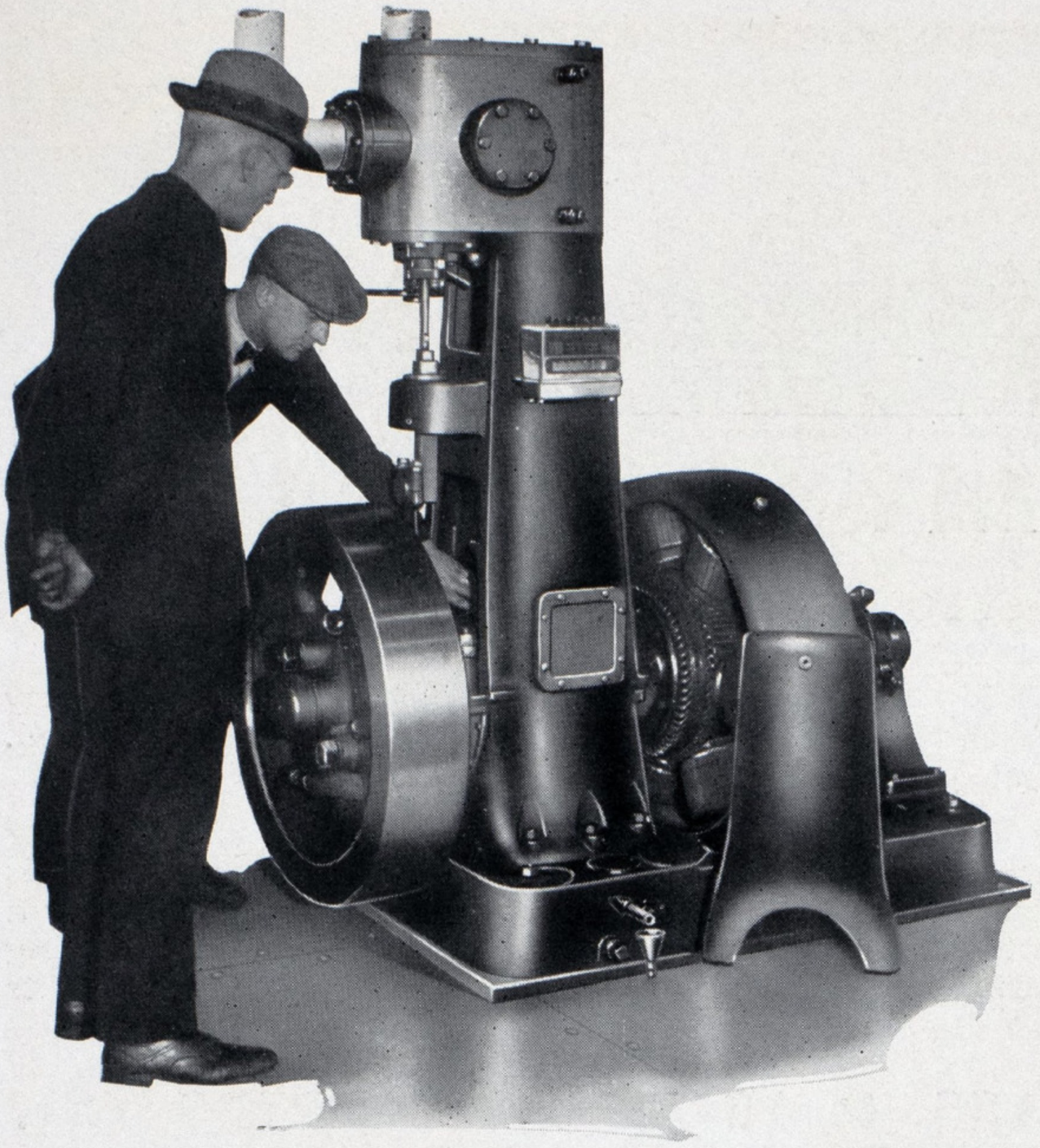

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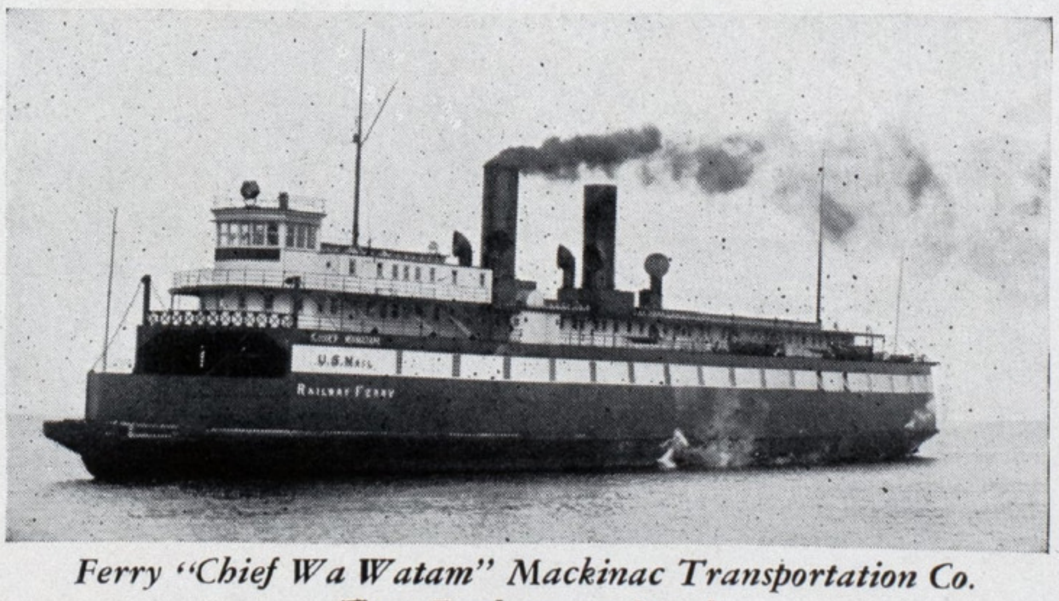

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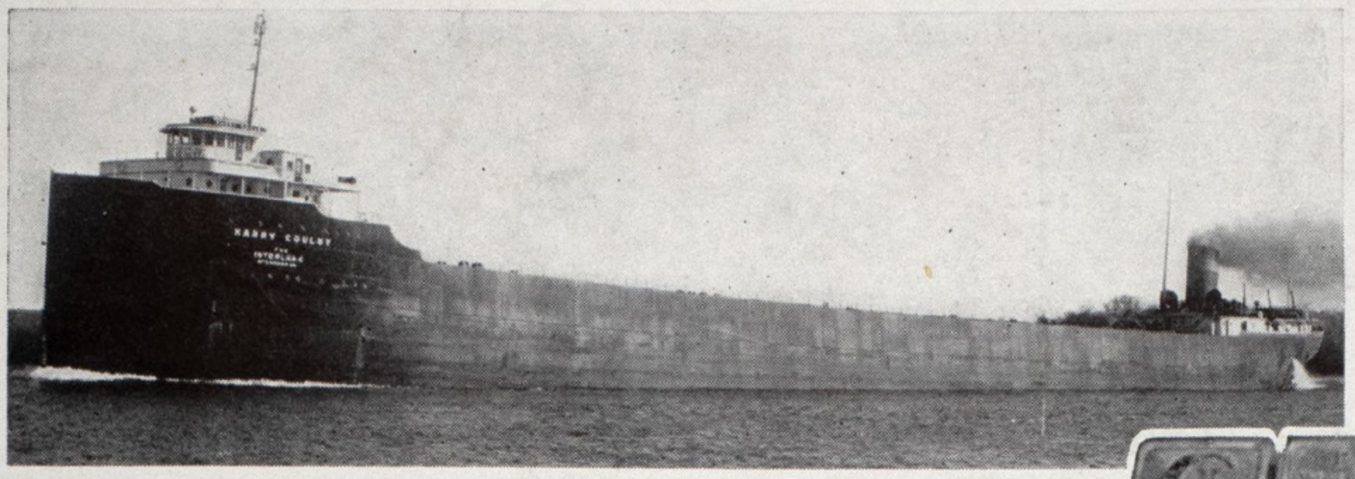

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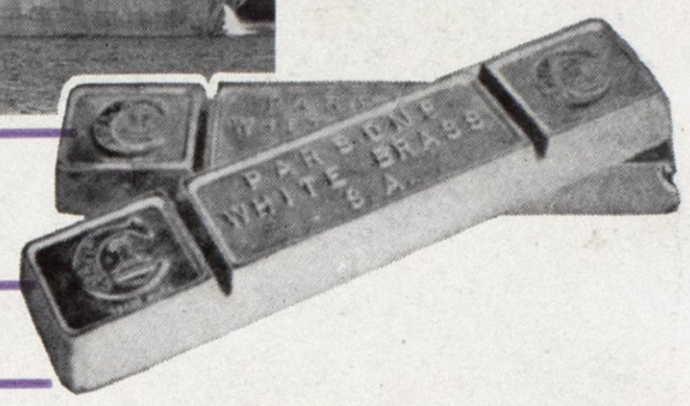

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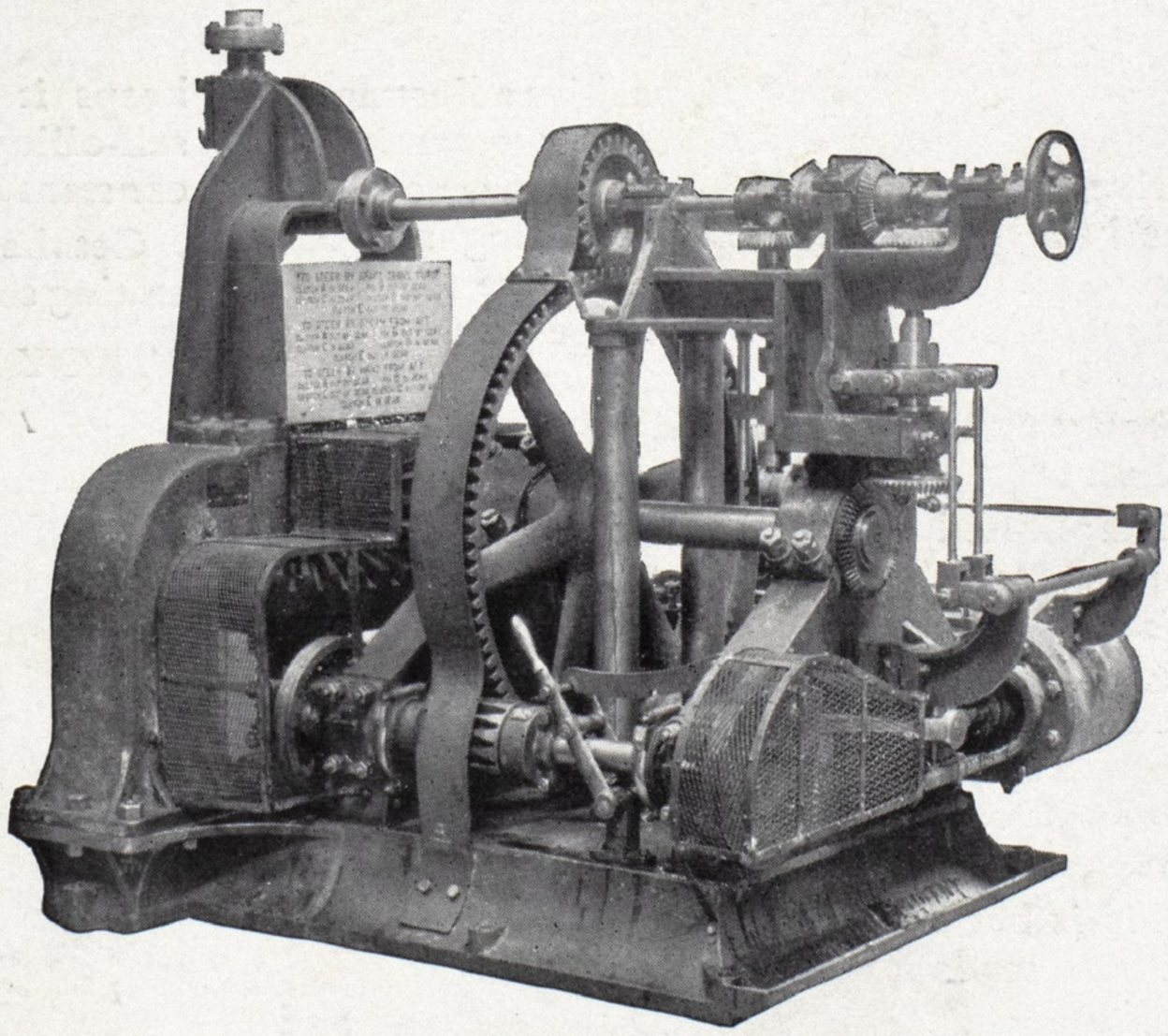

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